



PROCEEDINGS
of the
CATTLE CONFERENCE.

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Khan Sahib N. K. VACHA, Deputy Superintendent, Civil Veterinary Department, Baluchistan.

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M. MUHAMMAD SHAH NAWAZ KHAN, Divisional Forest Officer, Ajmer-Merwara.

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Dr. FERNANDEZ, Director, Animal Husbandry Department.

Kashmir State.

Mr. V. L. WAZIR, M.R.C.V.S., Superintendent, Civil Veterinary Department, Kashmir.

Patiala State.

Sardar JARMANI DAS, Secretary, Forest Department.

Captain A. H. SADIQ, Director of Agriculture.

Travancore State.

Mr. K. R. NARAYANA IYER, B.A., M.Sc., F.C.S., Director of Agriculture and Fisheries, Travancore.

AGENDA.

1. The setting up of suitable provincial cattle improvement funds on the lines suggested by the Animal Husbandry Wing of the Board of Agriculture as the best means of following up His Excellency the Viceroy's campaign for providing breeding bulls.
2. The improvement of grass lands and the better utilisation of waste and surplus land for fodder production and the initial steps to be taken in that direction by the various appropriate agencies.
3. The need for increased technical personnel required for livestock improvement work throughout India.
4. The possibility of crop planning for increased fodder production with special reference to leguminous fodders.

PROCEEDINGS OF THE CATTLE CONFERENCE.

The Conference assembled in the Council of State Chamber, Simla, at 11-30 A.M. on Tuesday, the 25th May 1937.

The Hon'ble Kunwar Sir Jagdish Prasad in requesting His Excellency the Viceroy to open the Conference said :

Your Excellency,

It is my happy privilege to extend to Your Excellency a warm welcome to this conference of Hon'ble Ministers from Provinces, representatives of the Government of India and of Indian States, technical experts and distinguished non-officials who are assembled for the purpose of concerting measures for the improvement of Indian livestock. This is a subject to which Your Excellency has given much needed prominence both by noble precept and praiseworthy example. In Your Excellency's first message to the people of India as Viceroy, Your Excellency gave a vivid picture of the whole problem in a memorable phrase : " The cow and the working bullock carry on their patient backs the whole structure of Indian agriculture ". Then followed the presentation by Your Excellency of pedigree bulls to the Delhi Province—an example which appealed to the sentiment and touched the imagination of the Indian people and which found ready response throughout the country. At a later stage, Your Excellency drew pointed attention to the need for the preservation of cows of well-known breeds after their lactation period was over, by the salvage of dry cows from Calcutta and their presentation to the Delhi Pinjrapole. Your Excellency's keen and informed interest in this vital matter of animal husbandry has stimulated public opinion, has encouraged effort and has heartened those who have been labouring patiently in this important field. Your Excellency, in a country where religious sentiment, dietetic needs and agricultural requirements all combine to make the improvement of livestock a matter of national importance, it is a depressing reflection that abstract veneration should only yield such practical neglect. Some of the malpractices to which our cows are subjected in cities in order to prolong their lactation period are a blot on our humanity, and it is about time that public opinion so asserted itself as to make such practices impossible. The law by itself is powerless to stop the evil-doer. Nor can we look with any satisfaction or pride on the vast numbers of lean, hungry and under-bred cattle that encumber the countryside. It is clear that passive sentiment alone is ineffective to deal with a problem which requires for its

proper solution scientific knowledge, efficient organisation and a consistent policy pursued with vigour over a number of years to achieve well-defined objectives. We need advice and guidance not only in regard to the methods of breeding but also in regard to the all-important question of an adequate supply of good fodder as well as in regard to the prevention and cure of disease and in regard to the most efficient form of administrative machinery. Some of these vital problems will engage the attention of this Conference and I need say no more about them at this stage.

Your Excellency, I need hardly add that much good work has been done in the past both in the Provinces, in States and at the Centre and the pace has appreciably quickened as the result of the recommendations of the Agricultural Commission, over which Your Excellency presided. A notable step forward was taken by the appointment of an expert adviser in animal husbandry to the Imperial Council of Agricultural Research in 1930, and I should like to take this opportunity of acknowledging the valuable services which Colonel Sir Arthur Olver has rendered to the advancement of animal husbandry and which have been recently recognised by the conferment on him of a Knighthood. Nor should I fail to mention the excellent work that the Imperial Veterinary Research Institute at Muktesar has done in investigations into animal diseases and in their prevention and cure under the able direction of Mr. Ware, whose good work has won for him a well-merited C.I.E. The Institute has been recently reorganised and the staff strengthened. We also hope soon to have well-equipped sections for animal nutrition and poultry research at Izatnagar in the Bareilly District of the United Provinces. But while a good deal has been done, it will be generally admitted that much yet remains to be accomplished. It is, for example, a little anomalous that in a predominantly agricultural country like ours, there is at present no provision for higher courses in veterinary science. We have to send our young men abroad for such training. I hope that it may be possible to remedy this defect in the not distant future, so that teaching up to the highest grade may be available in this country. We have also to secure that the methods that we recommend for cattle improvement reach the man in the village and are accepted and utilised by him, for without his willing co-operation little progress can be made. To ensure this, our administrative arrangements should be so devised as to establish the closest contact with the rural population.

Your Excellency, I need hardly emphasise the need for and the importance of a conference of this kind. It provides an opportunity for the exchange of ideas and the interchange of experience. It brings experts and laymen together. It enables Provincial Ministers to get a general view of the problem as a whole and it enables the Government

of India to realise the varying needs and circumstances of Provinces and States. It will also provide, I hope, a corrective against shifting policy and haphazard methods. It is a happy augury for the success of this very representative Conference that Your Excellency has, in spite of the pressure of a other engagements, graciously agreed to open it, giving one more proof, if proof were now needed, of Your Excellency's abiding and vigilant regard for all that touches the well-being of the agricultural classes. It is our earnest hope that work begun today, which is untouched by political controversy, may yield results of permanent value and that Your Excellency's Viceroyalty may come to be regarded in the chronicles of the future as the golden age of Indian agriculture. I have now the honour to request Your Excellency to be pleased to open the Conference.

HIIS EXCELLENCY THE VICEROY'S SPEECH AT THE OPENING
OF THE CATTLE CONFERENCE ON TUESDAY, THE 25TH MAY
1937.

Gentlemen,—

Let me first of all assure you how happy I am to welcome you all to this Conference and to the Headquarters of my Government. And let me thank you, Sir Jagdish Prasad, for the speech to which we have just listened, and for the kind words which you were good enough to use about myself and my interest in agricultural advancement.

The purpose of this gathering is that we may take counsel together upon the question of what may best be done in order to promote an early improvement and development of the livestock industry throughout India—in other words, to consider what practical steps can be taken to secure the better breeding and feeding of Indian cattle

The subjects with which this Conference is concerned have for many years lain within the Provincial sphere of administration. The opportunities for service open to the Central Government are now in the main limited to the fields of specialised instruction, research and the control and prevention of animal diseases. It is also the duty of the Centre to promote the exchange of information between Province and Province and to provide, from time to time, opportunity for the discussion of important problems and for the interchange of views, of which the present occasion is, I venture to think, a happy example. And let me hasten to add that not the least valuable outcome of such a gathering as this is that it affords guidance to the Central Government as to the manner in which it can best serve the requirements of the whole country. Acting upon the advice of the Imperial Council of Agricultural Research

and of the Board of Agriculture and Animal Husbandry in India, our equipment for this work has recently been extended by the strengthening of the central institution for animal research, while—as Sir Jagdish Prasad has told you—our proposals for a central institution for higher veterinary instruction are now assuming definite shape.

Gentlemen, it is not necessary that I should remind an audience such as this that the ox is the foundation of India's agriculture. Indeed, I am aware of no other single contribution which it lies within our power to make towards the enhancement of the agricultural wealth of this country which, in its potential value, is in any degree comparable with the general improvement of livestock. It has been calculated that the total annual cash value of livestock in India, if we include the annual value of cattle labour, dairy produce, manure and other products, is of the order of 1,300 crores of rupees. That no doubt is an approximate figure, but it serves at least to indicate the immense values at issue, and the scope afforded in this direction for the enhancement of the country's wealth.

And here let me say that, while cattle must be the chief concern of this meeting, many of the proposals which may result from your deliberations will be applicable to other branches of the industry such as sheep and goat breeding, both, in my opinion, deserving of and certain to repay, in full measure, the early attention of the departments concerned ; while wool production, the hides and skin industry, and, in some Provinces, horse breeding may well derive benefit as a consequence of your labours.

It is impossible to overstate the importance to the agriculturists of India of an adequate supply of good working bullocks. For the bullock provides practically the sole source of power available to the cultivator, whether for cultivation, for transport, or for the lifting of irrigation water. Nor need I emphasize the value of cattle manure or the importance of the place which cattle dung used as fuel still holds in the domestic economy of a large proportion of the rural population, much as we may regret that fact.

The great importance of milk production, whether produced by the cow or the buffalo, from the point of view of the country at large as well as from that of the cultivator himself, is now widely recognized. The facts as regards the average consumption of milk and milk products per head of the population, so far as these are at present available, go to show that, while there is great variation in this matter as between region and region and between household and household even in the same village, there is no doubt that the average consumption of dairy

produce is too low, more particularly when it is remembered that we are dealing with a country in which the diet of human beings is so largely vegetarian, and in which there is therefore a special need for such protective animal foods as milk, *ghee*, and curds. In this matter of developing the production and distribution of milk and milk-products, we look forward to the report of Dr. N. C. Wright, Director of the Hannah Dairy Research Institute, who recently spent five months in India examining our problems.

For the development on sound lines of animal husbandry as a whole and the cattle industry in particular, a scientific foundation is required, and the Central Government have recently given special consideration to the requirements of the country in this respect. Additions have been made to the Imperial Veterinary Research Institute, and well-equipped sections for animal nutrition and poultry research have been provided at the Izatnagar branch of the Institute. When the section on animal genetics has been added, the institute will compare favourably with similar institutes in other parts of the world. The function of a central institute of this kind is to promote cattle improvement and the control of diseases in the Provinces and throughout India. But it will at once be obvious that unless suitable organisations exist in the Provinces which are capable of co-operating fully with the experts maintained at central institutions, much of the labour at the centre may be wasted and the ryot will fail to obtain the full measure of help which he needs. As I have already said, this is a Provincial question and each Province has its own special requirements and limitations, but it seems desirable that we should take counsel together in this all-important matter, for it is abundantly clear that, if anything adequate is to be done for the improvement of cattle in India, more technical staff of every grade is needed and, above all, continuity in breeding policy.

I am indeed glad to tell you that the response to my appeal for breeding bulls and for funds with which to purchase and maintain them has been highly gratifying. The position at present is that, in addition to a number of collective donations, as many as 1,073 individuals have responded to my appeal with donations of either animals or money. No fewer than 1,322 bulls have been presented or promised, while the cash subscriptions which have been offered amount in all to no less a sum than Rs. 1,65,000. In addition a sum of Rs. 1,000 has been received for the rescue of valuable animals from city byres. This response has been a very great encouragement to me, for I am convinced that better sires must be the foundation of our policy of breed improvement. But let me remind you that better bulls can only be the first step. It is essential, if real and lasting benefits are to accrue, that the bulls should be adequately maintained. The question of opening a Cattle Improvement

Fund in each Province is, therefore, a matter in which I take the keenest interest. The purpose of these organisations would be the provision of adequate financial resources, the creation of an organisation devoted to the proper care and maintenance of all approved stud bulls ; and ultimately, I hope, the provision of further suitable animals.

The art of breed improvement must inevitably be founded upon the accurate recording of pedigrees. The Imperial Council of Agricultural Research, with the co-operation of the appropriate Provincial Departments, has undertaken the establishment of pedigree herd books for the principal milch cow breeds of India and as a first step has set up a small committee for the definition of breed characteristics. This is a type of work which I greatly hope may be much more fully developed provincially, not only by the establishment of provincial pedigree herd books for the most important draught breeds, but also by a more extensive system of registration of all the stock produced from " Gift " and other good sires. The fact must be faced that, laborious as such registration may be, it is essential if the continuous improvement of Indian cattle is to be secured. Without registration of progeny, and of their performances, even a very extensive system of distribution of stud bulls may easily fail to make any lasting impression on the cattle of the country. Method well devised and faithfully pursued through a long series of years is essential to the achievement of complete success.

Let me at this stage assure you that I have at all times in mind the excellent work on cattle breeding that has already been carried out, mainly by provincial departments—work which in many districts has already yielded a rich return in the shape of a general improvement in the local breeds.

Unless cows, calves and bullocks are to be fed better than is at present the case, efforts to improve breeding will obviously be of little avail, and I am glad to note that two of the four items on the agenda of this Conference deal with this aspect of cattle improvement. The provision of better grazing and the greater production of suitable fodder crops are two separate but closely related aspects of this great problem. The former was discussed at length by the Board of Agriculture and Animal Husbandry at Madras last December, their task being greatly lightened by the labours of a most important preliminary conference of Forest Officers which has done much to clarify the position as regards forest grazing and the utilization of waste land. The Board have made some important recommendations both as to the better utilization of existing grazing areas and the possibility of converting land at present waste into useful pastures. In this connection it is my personal opinion that further research and experimental work on the

grasses of India, and the possibility of acclimatizing useful exotic fodder grasses, are matters deserving of early attention. India is not a pastoral country as judged by the usual standards of temperate climates. Nevertheless the improvement of the grazing lands, and an increase in their extent, might do much to raise the general standard of the working cattle of the country. In most areas however the grazing must be supplemented by other foods and for the actual feeding of a very large percentage of our animals we must depend on the straws of cereal crops and on fodder crops. The time has come when there must be deliberate crop-planning for increased fodder crop production. Without anticipating the discussion on this subject, it may be said that, if the additional resources placed at the cultivators' disposal by improved varieties of staple crops and by improved irrigation facilities are wisely used, there is scope for a much larger production of fodder crops, especially leguminous crops, in a manner which would mean a gradual and steady rise in the efficiency of the cultivator and his cattle. The proposal of the Board of Agriculture and Animal Husbandry that each Province should set up a grazing and fodder committee linked up with a central sub-committee under the Imperial Council of Agricultural Research will be submitted for your consideration as a practical way of making a start and at the same time of arranging for an interchange of information and experience. I cannot overstate my sense of the vital importance to India of this question of animal nutrition, for I believe it to be true to say that an essential step towards the better nourishment of man must be to improve the food supply of his animals.

Let me end as I began by affirming my profound conviction that we can make no greater contribution towards the welfare of the cultivator than by promoting the improvement of cattle throughout India. Let me also assure you that success in this endeavour is within our reach and competence,—technically, administratively and financially, if we can but come to a right policy and if we persist in our endeavours. Public opinion and the enthusiasm of the agriculturists are with us in no uncertain measure. Let us devote ourselves to this great purpose with high courage and unswerving devotion. I am confident that you, by your labours in this Conference, will make a most material contribution towards the advancement of Animal Husbandry in India, and I leave you now to your arduous labours. (Applause.)

His Excellency then withdrew.

After H. E. the Viceroy left the Chamber, the Honourable Kunwar Sir Jagdish Prasad occupied the Chair.

Chairman : The first item on the agenda is the setting up of suitable provincial cattle improvement funds on the lines suggested by

the Animal Husbandry Wing of the Board of Agriculture as the best means of following up His Excellency the Viceroy's campaign for providing breeding bulls. I would first call upon Sir Bryce Burt to explain the position.

Sir Bryce Burt : Sir, after what has been so eloquently said by His Excellency the Viceroy and yourself, there is no need for any preamble, and if I may I would like to at once try to summarise the main points on which we would like to try and take decisions on subject No. I. The question before us was very carefully considered at the Board of the Animal Husbandry Wing held at Madras in December last, and the general conclusions reached are summarised in the paper before the conference. It was found that there was a general view that some suitable provincial organization should be set up and a provincial cattle improvement fund started. The Board have in mind an organization which would be largely non-official in character and which would see that the money available is applied to the best advantage. Briefly, the position in various provinces is as follows. In Madras, there is already a proposal to start such a central fund. In Bombay the need for such a fund has already become obvious and one is under consideration. In the United Provinces there is already a provincial cattle board, with district cattle improvement committees, to which the donations have been allotted. In the Punjab it has been possible to place the gift money at the disposal of the District Boards to supplement their normal activities in cattle improvement matters. In Bihar and in the C. P. provincial cattle breeding associations have been established. In Orissa also a cattle breeding society has been formed, of which H. E. the Governor, is the President. A proposal is under consideration for the establishment of a cattle breeding association in Assam. In the N.-W. F. P. the additional funds obtained have been used to supplement the departmental bull subsidy scheme. That, Sir, is the summary of the position, so far as we are aware, at the present moment.

Sir, it will be seen that in most provinces there is already a move towards a provincial cattle improvement fund and some form of provincial organization. Here I would say that we all trust that the response to this appeal will continue and grow and that the establishment of definite provincial organizations will provide an added stimulus to private generosity. One suggestion which occurs to me is that if one could start an annual cattle improvement day annually on which each member of the population would contribute a minimum of one pice, one would obtain funds for the cattle improvement far beyond present expectations.

A matter which merits the special consideration of the conference is the form which provincial organizations should take. In some instances provincial advisory boards appear to be doing good work, as they advise on the cattle breeding policy of the province, are in close touch with live-stock officers and have a say in the utilisation of funds provided by Government. Such boards could appropriately advise on the uses to which a provincial fund should be put. In other instances, the trend appears to be towards independent associations actually controlling the funds created by private donations. There is much to be said for each form of organization and this is a matter on which a free exchange of opinions

would be very helpful. Whichever form of organization is adopted, the question of its relations with the Ministry of Agriculture will need very careful consideration. Whatever the membership of the board or association, it is clearly desirable that it should include the expert officials of the Provincial Departments concerned with livestock improvement.

There are thus three main points for our consideration—(1) the establishment of cattle improvement funds, (2) the nature of the provincial organization for the administration of that fund, and (3) its relationship to the several Ministries of Agriculture and to the expert officers concerned with livestock improvement.

Chairman : Would any member now like to start the discussion ?

The Hon'ble Rao Bahadur M. C. Rajah (Madras) : Sir, before I begin to say what the Madras Government propose to do with reference to this fund, I should like to clear a misstatement of fact. Sir Bryce Burt just said in his speech that there is already a proposal in Madras to start a fund, and when he said that I suppose he referred to para. 5 of the Note by the Imperial Council of Agricultural Research. It is stated there that there is a proposal to start a fund in Madras, but that is a misstatement of fact. It is said in the Note that in Madras it is proposed to start a central fund out of donations received and that this fund would be dealt with by the Provincial Economic Council and distributed as required to District Board. I am given to understand that a suggestion somewhat to this effect was made at the Animal Husbandry Wing held at Madras in December last. But it was a mere suggestion. It rather expressed a fond hope of Mr. Littlewood and nothing more. But that hope has not been realised. The response in Madras to H. E. the Viceroy's appeal has been disappointing. There have been only 28 instances of presentation of stud bulls and the total amount donated was only a little over Rs. 3,000. We have not lost hope and propose to make another attempt. But we would also appeal to the Government of India for some substantial contribution to our fund.

Cattle breeding, however, I must say, is a very slow process. We already have a Cattle Farm at Hosur with over 600 heads of cattle costing over Rs. 1 lakh a year. We have proposals in hand to start a buffalo farm at Prattur on the right bank of the Kistna River and a farm for Ongoles at Lam near Guntur and we are hoping to start the first during the current year and the second in 1938-39 provided of course funds are available. But I am afraid these cattle farms will take a long time to make an impression on the livestock of the country.

In the meantime, however, we are doing what we can to expedite the process. We have a premium scheme in Madras. We also have a "grant" scheme. Under the "premium" scheme, the Government encourage private individuals or institutions to purchase and maintain breeding bulls of approved type. The premium paid is Rs. 100 (Rs. 50 for maintenance and Rs. 50 for service). There are 108 stud bulls now maintained in the Presidency under this scheme. Under the "grant" scheme, the Government instead of paying premia make a consolidated grant to District Boards to cover roughly half the cost of purchase of bulls. The

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District Boards distribute the bulls among the ryots for care and maintenance subject to certain rules regarding service and maintenance of registers. If the ryots follow the rules for a period of 2 years, the bulls become their property. Government are paying the District Board of Coimbatore a sum of Rs. 2,000 for 3 years for purchase of 20 breeding bulls per year. They have also promised to pay Rs. 750 per annum for 2 years to the same Board for purchasing 5 Sindhi bulls and 5 Delhi buffalo bulls per year. A grant of Rs. 1,200 per annum for 3 years has been sanctioned for the West Tanjore District Board for purchase of 12 bulls per year. A grant of Rs. 1,200 has been sanctioned to the Chingleput District Board for purchase of 12 bulls. We have also recently allowed some 140 Co-operative Societies to buy a stud bull each from their Common Benefit Fund and have directed the Agricultural Department to pay premia in respect of these bulls. A cattle breeding co-operative society will shortly be started with 15 stud bulls in the Hallikar area in the Salem District. We expect that these measures would shortly provide a fairly large number of stud bulls in the country.

Our immediate difficulty, however, as observed in the I. C. A. R.'s note is that there is no provision now for the care and maintenance of the bulls donated by private individuals in response to H. E. the Viceroy's appeal. In fact, the 28 stud bulls donated in most cases continue to be in the custody of the donors themselves. It is to meet this difficulty that the I. C. A. R. has suggested a central fund. It occurs to me that a possible line of approach would be to rouse local interest in livestock improvement. In South Kanara district a Livestock Improvement Association has actually been started within the past one year. The donations made in response to H. E. the Viceroy's appeal have been collected by the Association. If we succeed in starting similar associations in each district, they might take over the care and maintenance of these bulls. I propose to have this possibility also examined.

The Hon'ble Chaudhuri Sir Chhotu Ram : Mr. Chairman, so far as the general question of policy is concerned, the Punjab Government is entirely at one with the proposal that has been put forward for the establishment of a Cattle Improvement Fund. But while the Punjab is prepared to accept the proposal in principle, we very clearly realise the limiting factor in the way of finances. I know from personal knowledge, both as a member of the District Board, and as a former member and also a present member of the Punjab Government, that finances have always been a very sore factor with regard to the improvement of cattle. I remember that we used to spend about Rs. 30,000 a year in the way of grants to District Boards. That was in 1924-25. We increased this grant later on to about a maximum limit of Rs. 50,000 for the Haryana breed and about Rs. 24,000 I believe in respect of another noted breed of the Punjab. When the depression came we had practically to stop these grants and I think just at present the aggregate of these grants is about Rs. 15,000. In the next budget we are going to raise this grant to Rs. 36,000 in the case of Dhanni breed but nothing so far has been contemplated in the way of an addition to the improvement of the Haryana breed. However, on the whole, the Punjab has been doing a good deal more than almost any other province I am sure. For instance, we are maintaining a very big farm at Hissar, the area is over

40,000 acres, and the head of cattle is in the neighbourhood of 10,000. This farm is costing us between Rs. 2 to 3 lakhs a year. Over and above this farm we have about four or five farms which are being maintained by private gentlemen on lands granted by the provincial Government to them on cattle breeding conditions. The total area of these private farms is, roughly speaking, about 28,000 acres. In addition to the big farm at Hissar and the four or five private farms we have been doing something in the way of encouraging private owners of animals of good breed. We are giving stipends at the rate of Rs. 3 per cow or per bull in the Dhami Tract. In the current year our bill on this score will come up to 6,000. Then we have also tried the experiment of holding one day cattle shows in various chosen centres in the cattle producing districts.

So far as the actual response to the Viceroy's appeal is concerned, we are not fully satisfied with it, but I am glad to say that the response in the Punjab is far better than that in Madras. We have received donations of 588 bulls by private donors. The Punjab Government itself has done a good deal in the way of supplying stud bulls at very much reduced rates. The usual price of a Hissar stud bull is I believe Rs. 400, and we are at present giving away bulls at a price of Rs. 100 for young calves of about 3 years. Now, the number of bulls issued so far from the cattle farm at Hissar is 6,000. That is a fairly large number and if we are allowed by our finances to expand our activities in Hissar we propose to raise the annual supply to 1,000 bulls. At the present moment we are not in a position to supply more than 600 a year. The present available supply at the farm is 700. We may be able to raise this number to 1,000 provided we are in a position to make a better provision in the budget, of which I do not see many chances. So, I support the request which has been made by the Hon'ble Mr. M. C. Rajah that if the Government of India wishes that cattle improvement should make any real headway, it should come to the rescue of the provincial finances. As you are aware, the sources of provincial revenues are very much limited, and unfortunately, they are not capable of expansion. All the sources of revenue which have been allocated to the provinces are inelastic and rigid. Therefore, so long as we are unable to get hold of sources which will respond to an increased demand easily, we should receive very generous help from the central revenues.

It will also interest the Conference to know what the Punjab has been spending on cattle breeding every year. Our average is a little more than 20 lakhs a year, a figure which will compare very favourably with the amount that is being spent by any other province in India.

The Hon'ble Mr. B. Gur Sahay Lal (Bihar) : The importance of provincial funds cannot be over-estimated, but the whole question is that there should be a permanent fund in order to carry out this propaganda and this work. His Excellency the Viceroy's appeal has had some response in my province also, but that is not at all satisfactory, and I support my friend the Hon'ble Mr. Rajah in his plea that there should be a permanent fund from the Central Government in order to carry out

this improvement. As soon as this fund is available, then some improvement can be made and a central association can be created. Under that central association there should be district associations. The breeding of bulls may be centralised in the province and the actual details will be explained by my Secretary, Mr. Lal, in this connection. I have spoken generally on the question and I support the appeal for contribution to our fund.

The Hon'ble Sriman Mandhata Gora Chand Patnaik Mahasayo (Orissa) : I come from Orissa, and as you know, it is a very poor province, a very backward province. The tail ends of three different provinces were placed together to form this Orissa province, and therefore we have all the disadvantages of the three different provinces. My Honourable friend Mr. Rajah said that Madras is at a disadvantage, but I may say we have the worst disadvantage of Madras. The Hon'ble Minister from Bihar said that Bihar is at a disadvantage. Being the tail end of Bihar on one side we have the worst disadvantage of Bihar. So far as I know, milk is not available in many parts of the province for even children. The state of things is very, very backward and the little that has been done cannot be said to be adequate in any way to improve the condition in Orissa. Therefore, the first thing that we have to see is whether the Government can afford to spend any money at all. We are a deficit province and we get a subsidy of Rs. 40 lakhs a year from the Government of India, and out of this sum, for some reason or other, for services rendered or supposed to be rendered the other provinces take a large portion. We are left with practically nothing which we can spend on ameliorative measures. We cannot cut down the services that we have to maintain, we cannot reduce the salaries or anything like that, and those salaries have to be paid. Therefore, we are left with practically nothing to spend on ameliorative measures. Again, there are very few zamindars who hold impartible estates in certain parts of the province. One of them has his income pledged to the extent of one lakh to the Andhra University and we cannot expect to get anything from the Maharajah of Jeypore. There is the Maharajah of Parlakimedi, he is doing something in this direction, but the little that he is doing is not sufficient to ameliorate the condition of the people. The other zemindars, of course, cannot be expected to do much. There is a class of temporarily settled estates, which I would say are owned by persons who are neither zemindars nor ryots, and very many of these estates come up for sale every time kist has got to be paid, and the sooner that class disappears the better for the province, for themselves and for the ryots. Then we have got permanently settled estates in north Orissa and most of them are owned by people who have their homes in other provinces. Therefore, they do very little to improve the condition of the people of Orissa. These are the conditions under which Orissa is now placed, and if you do not take these into consideration, you may exclude us altogether from the scope of the activities of this association or any other association of this kind. I appeal to you strongly to do what you can for the improvement of Orissa. Our problems are unique. We have the disadvantages of three provinces. You must take into consideration all these facts and do something to improve the condition of the people and cattle also there. Unless the Government of

India comes forward to do something for us, the Orissa Government can do very little to improve the condition of the people.

The Hon'ble D. B. Sir S. T. Kambli (Bombay) : Sir, I shall tell the Conference what the Government of Bombay has been doing in the matter of cattle improvement. The Government of Bombay has been maintaining 5 Government cattle breeding farms in various parts of the Presidency and also they are subsidizing four private cattle breeding associations as well. The five Government farms are situated at Chharodi, Surat, Tegur and Bankapur and one at the Agricultural College at Poona and the four private associations are situated at Jalgaon, Jemner, Sangoi and Khandivalee. We have been putting out premium bulls for service in various parts of the presidency. The total number of such bulls we put out number 290. They are given to the villagers under certain conditions. That is the position in Bombay:

Now, Sir, coming to His Excellency the Viceroy's appeal and the response to it in the Bombay Presidency : We received a sum of roughly Rs. 61,000 in response to this appeal and also 28 bulls were received in response to this appeal. Looking to the total amount which the appeal has brought, I think Bombay has given a very good account of itself. We have received 61,000 out of a total of 1,65,000 or so for the whole of India. One important point arises in connection with the donations made by the various people and associations in the Bombay Presidency. Most people who have donated either bulls or money have done so on the express condition that the bulls or the money which they have donated should be utilised or spent in their respective districts. Local interests seem to be the main guiding factor in making these donations. Another difficulty seems to confront the Bombay Presidency in utilising this money. We have purchased about 40 bulls by spending Rs. 8,000 out of the 61,000 received by way of contribution from the people. The question is how to maintain these animals. Our investigation has shown us that a very large number of selected villagers will come forward to maintain these animals out of their own monies for three years provided they become the absolute owners of these bulls after the period of three years. Otherwise the Government shall have to pay the maintenance charges for each one of these bulls. We should therefore take advantage of the offer of the villagers in this respect.

Sir, I think we should take note of this desire of the people to spend money in their own districts and therefore what I do suggest is this. There should be a provincial cattle improvement association with district branches largely devoted to the collection of funds and the administration of those funds in their own districts. What the provincial cattle improvement association and the funds of that association should do is to co-ordinate the activities of these various district associations and also spend the money which they have collected for the province by subsidizing those districts where the response is poor or where efficient work could be more usefully done.

Sir, we have heard tales of financial woe from the various provinces. Obviously the financial position of Provinces is not satisfactory. The

Provinces stand in need of financial help from the Central Government. I therefore appeal to the Government of India to set apart one crore of rupees to be distributed to the various provinces to serve as a nucleus for the provincial fund. This will not be a very big thing. Looking to the interest that the Viceroy has been taking in this matter, looking to the larger interests of the cultivator and to the benefit to agriculture in India as a whole, I think the appeal which I make to the Government of India will not be made in vain. I want a crore of rupees to be set apart from the revenues of the Government of India to be distributed to the various provinces, so that this help from the Government of India will stimulate local interest and generosity of private persons and will go a long way in making this work a success. Otherwise I am afraid the work hitherto done will continue to be done with very little progressive efficiency. If you want to make a thorough success of this scheme, which I hope is the intention of everyone assembled here, then I do appeal to the Government of India to set aside a crore of rupees to be distributed to the various provinces in certain proportions. It will serve as a nucleus to the provincial fund. It will stimulate private effort and local generosity and will also give a great impetus to the work which we have in view.

The Hon'ble Rai Bahadur Raja Maheshwar Dyal Seth (United Provinces) : The Minister for Development from Madras started the discussion with a note of correction in the note put up by the Imperial Council of Agricultural Research. I am afraid I have got to do the same. I find this on page 2 of the note : (Hear the Minister quoted a sentence). As a matter of fact there are no such committees at present and there is no provincial board. I will tell you what we in the U. P. contemplate doing. It is proposed to organise in each district a district cattle improvement committee. The district officer will be the Chairman and every district official and all non-officials interested in the movement will be members to assist him in this great task. The Committee will include representatives from village cattle improvement committees and will be so constituted as to give as wide a representation to the cattle and livestock interests of the district as possible. The Committee will advise Government in regard to the livestock schemes, to assist in their supervision and to do everything in their power to promote the development of the livestock industries. From the district cattle breeding committees of the province, it is proposed to constitute a provincial cattle breeding board composed of officials and influential and well-informed practical men capable of representing cattle breeding and other livestock interests of the province. It is proposed that the Board should consist of two members selected from the district cattle breeding committees of each revenue division, 16 in all in U. P., two members of the Legislative Assembly nominated by the Government and two elected by the Assembly, the Senior member of the Board of Revenue, the Director of Agriculture, the Registrar of Co-operative Societies, the Director of Veterinary Service, the Deputy Director of Agriculture will be *ex-officio* members. The Personal Assistant to the Director of Agriculture will be the Secretary of this Provincial Board. The senior member of the Board of Revenue will be the President and a non-official member of the Board will be elected Vice-President. The Board will consist of 25 members and a

Secretary. Such an organisation will ensure the active and financial co-operation of all zamindars and agricultural leaders interested in the development of these industries throughout the province and cannot fail to give practical effect to the express wishes of His Excellency the Viceroy. Having told you in brief what we propose doing, I shall tell you what we have actually done so far for the improvement of cattle breeding in U. P. We have four cattle breeding farms from which we have a free supply of stud bulls all over the province and we have actually supplied a little over 5,000 bulls to the villagers for cattle breeding purposes. Our scheme is that out of approximately an expenditure of Rs. 80 on each bull, Rs. 22 has to come from the villagers themselves or from any individual. The rest is met by the Government out of a grant of Rs. 25 thousand a year which the U. P. Government makes for this purpose. This is over and above the free supply of bulls from our four breeding farms in U. P. Our total expenditure on these cattle breeding farms in U. P. is over a lakh and 50,000 but this solves only a part of the problem. It has been estimated that we actually require about 3,000 bulls a year for at least 12 years to come before we can solve this problem to any satisfactory extent. The Government of the U. P. certainly proposes to increase its grant towards the purchase of bulls from Rs. 25,000 to Rs. 50,000 this year and it may be more next year. Here I think there is no use in my indulging in the fruitless task of making a request to the Government of India to come to our aid but as my Honourable colleagues from other provinces have made this request, I feel certain that if it is granted the U. P. will certainly get a share of it. The question of the maintenance of these bulls in the U. P. is a very ordinary one and it does not require any serious efforts to solve it. Our bulls in the U. P. have a right of free grazing and they are looked upon by the villagers as a sort of local and national institution. They graze freely and I think on the whole they are in excellent condition. Wherever they are diseased or out of use, one man in each village who is supposed to be responsible for these bulls reports to the nearest Veterinary or Agricultural officer, whoever he may be, and the bull is taken back and a new bull supplied. The question of maintenance therefore does not arise in the U. P. but the main problem of supplying a large number of stud bulls remains to be solved. There is another problem. Supposing the funds are available, it is rather difficult to get a large number of good stud bulls either from our own province or from outside and for that purpose I think the cattle breeding farms will have to be increased before we can get the proper supply which we require for our purposes. Some suggestions have also been made in this note by the I. C. A. R. but it appears to me personally that this is in too advanced a stage. At the moment our problem is to get a supply of good stud bulls to the villagers and in concentrating our attention on intensive development in some districts. The whole province is too big an area to tackle this problem seriously and at any rate the cattle breeding must take a few generations before we can have an improved variety of bulls. The supervision of its organization, of which I have talked just now, in the village divisions must devolve on the Collector or the Deputy Commissioner, who will be assisted by the non-official gentlemen of the district interested in the movement. With regard to our response to the Viceroy's appeal, I do not know if I said it has been rather good or bad, but to tell you the truth, the actual figure is only a little over Rs. 5,000. Certainly this sum is too small to tackle the problem on any serious basis, but with the interest that is growing in it

movement, thanks to the initiative given by His Excellency the Viceroy and the great personal interest which he takes in the matter and the interest which is being taken by the bigger *taluqdars* and *zamindars* of the United Provinces, and the extra funds which are going to be provided by the Provincial Governments for this purpose, I think, we will certainly solve this problem in the United Provinces. Later on, when we have developed this sphere of activity, will be the time to tackle such problems as the registration of the progeny of bulls or the recording of milk wherever milch-breeders are available. Work on these advanced lines is certainly going on in some part of the province, for example, in the Muttra district where we have organized a supply of a little over 200 Hisar bulls and we are having proper registers of the kind suggested by the I. C. A. R., but I would simply say this that it is not possible to do it on a large scale and we must concentrate our attention on a limited area while trying to supply good stud bulls all over the province.

The Honourable Mr. B. G. Khaparde : Sir, we are a small province and I think you will be right in expecting that my speech also should comparatively be a small one. I shall state in brief the position we have in our province but before I do so I should like to say that we are in complete accord with what is being done in this matter by the Central Government and the appeal of the Viceroy has not fallen on deaf ears in our province and we have been doing all we possibly can do according to our means to help this propaganda and the purpose in view. We have 289 bulls purchased as a result of the Viceroy's gift to our province. 103 bulls have been secured from Government grant, and 187 by donation from private persons : so you will be able to see that we have done a great deal in this way. Then, private donations have been coming forward. I cannot say that these have been coming forward grudgingly but there has been more than one fund in our province that is being collected and this fund alone could not impel all the donors to do their best in this behalf. We have established an association in our province to help in the improvement of the livestock. At present the response for funds, as I said, has not been very generous but I hope, as time passes, and the benefits of this scheme are realized, that a more generous response will come forward. The Government in our province are going to publish a programme of work. After I left my province perhaps the programme has been published by now ; if it has not been published by now, I think it will be very shortly. In that programme we are providing for the establishment of a cattle breeding farm at a place called Davar (?) in Saugar district. The initial cost of establishing this farm for the first year would be Rs. 30,000. For the next year it is expected to be Rs. 47,000 and the recurring cost of the maintenance of this farm is expected to be Rs. 16,000. I need hardly tell you, Sir, and I am sure you will appreciate it, that our small province cannot put in all this money in this concern and I should be excused if I join my fellow brothers in praying that money should come forward from the centre. I will only add that the bigger provinces have higher resources and therefore their capacity for saving their money is also bigger and they can thus spare the money but the smaller provinces cannot, and I feel that I shall get all due support when I appeal to the Government of India to give donation more generously to the smaller provinces rather than to the bigger ones (Laughter) ; and I shall join my brother from Orissa in all

that he has said in this behalf. We have however been a small province and as he put it, our tail has been cut off and added on to them. So we are still smaller now and therefore my appeal has the greater force. The Forest Department in our province regulates grazing, and as the notes have been provided to all the members of this House they will have noticed that our province have been doing a great deal in this behalf, and if they peruse these notes and if they care to look into the working of the Forest Department in our province, I believe their labours will not be spent in vain. Then there is one thing that I wish to add to what I have already said. The output of bulls from the Government farms is only about fifty per year, and we have three million cows. So it will be easily appreciated that the strain on these poor bulls is enormous (Laughter). Out of these fifty that the Government farm produces, some again, are too young and some are too old (Laughter). We therefore need help in this behalf, and we shall thank you, Sir, to lend us some bulls from the other provinces. In our district associations we hope to establish small centres at which breeding will be controlled by persuasion. I do not think I need mention any details and tire out your patience as I know we are looking forward to a very interesting programme. I wish therefore to thank you for giving me this patient listening and I finish. (Applause.)

Chairman : We shall adjourn now for lunch. We shall now go up to lunch as His Excellency the Viceroy has invited all the members of the Conference to luncheon, and we shall re-assemble after lunch—it may be about 3 o'clock.

The Conference re-assembled after Lunch at 3-10 P.M., the Hon'ble Kunwar Sir Jagdish Prasad in the Chair.

Chairman : Mr. Khaparde, probably the Conference would like to hear your views about the fund because you said nothing in your speech as to whether you approve of the proposal to have a provincial fund and, secondly,—and this is a point which has not been mentioned by previous speakers—what should be the relation of an Association or a Committee which is going to be established to the Ministry. That is a very important point. I shall be glad if you will give us your views on the subject whether you approve of the idea of a fund and what in your opinion should be the relation of this Association or Committee to the Ministry. If you wish to speak on this subject, I shall be very glad.

The Hon'ble Mr. B. G. Khaparde : Sir, in our Sanskrit there is a very salutary proverb, which, when translated into English, means that before we begin anything auspicious, we must have a basketful of grass. That only means that nothing can be done without funds. And when I am called upon to express my opinion as to whether funds in provinces should or should not be started, I feel that there could not be two opinions about that. I think everybody will agree that funds are absolutely necessary for carrying on propaganda and realising the ends for which we have all combined now to work. At the same time, I feel

constrained to say that much should not be expected at this time from the provinces for the very simple reason that my province has been going through lean years for a long period—about six years—and we have lately contributed to several funds. Though we recognise the importance of building up a fund for this purpose, I hope it will also be recognised at the other end that we have our own limitations within which we can make progress. This is so far as the fund is concerned.

With regard to the relations that this Association should bear to the Ministries, I think the Ministries and the Provincial Governments believe in direct communication with this body, and the provinces ought to be kept well-informed as to what is going on in consequence of the resolutions that will be adopted in this Conference. The Provincial Committees, if such are formed, will take cognizance of all the resolutions passed by this Conference and reports might come up from all provinces as to what action has been taken in order to materialise those resolutions. I hope these resolutions will be sent to different provinces. I do not know if it is under contemplation as to how the funds that will be collected should be divided, but my own idea is that the provinces should be allowed to keep a very large proportion of the funds that will be collected by them. If there be any idea of getting the provinces to contribute to the funds that will be supplied from the Centre, the scheme may not work smoothly.

Chairman : I do not think there is any proposal to ask for any contributions from the provinces to the Centre.

The Hon'ble Mr. B. G. Khaparde : I am very grateful to hear that from you, Sir. On the other hand, I was just going to say that we are expecting some help from the Centre itself. If the Central Government finds that strenuous efforts have been made by the Provinces in order to collect funds, I think those provinces deserve help and we hope that the Central Government will help the provinces with funds. As I told you, in spite of our keen desire to follow the programme and in spite of our keen desire to materialise the resolutions adopted in this Conference, we may find it very difficult for want of money to carry the resolutions into effect. As I have been just telling this House, our programme to start breeding farms is going to cost us about Rs. 47,000 next year and Rs. 30,000 to start with and there will be a recurring expense of Rs. 16,000. Now, to undertake a project of that kind it is practically beyond the powers of our province as we stand today. I have no more suggestions to make.

The Hon'ble K. B. Saadullah Khan : Sir, the N. W. F. P. is a very small province with limited resources of income, but still we have been able to subscribe to the appeal of His Excellency the Viceroy about Rs. 17,000 or Rs. 18,000 from the whole province. This shows that a population of 3 millions of people have been able to subscribe to that extent. If the same ratio had been observed by the rest of India, then I believe several lakhs would have been collected towards that fund. There is a small district agency, outside the British Empire, that is in the tribal territory and in that agency the population is only 50,000 and there they have been able to collect about Rs. 5,000 and if that proportion were observed, then a sum of more than 2½ crores would have been subscribed to the fund.

This is all due to the exertion of the district officers and through the co-operation of the people. We appreciated this scheme very much and of course the provincial people have subscribed about Rs. 13,000 from the settled districts and in addition to that we have subscribed Rs. 15,000 from the provincial funds and Rs. 12,000 from the district boards. This shows how the N. W. F. P. people take keen interest towards this scheme.

Now Col. Noel our Director of Agriculture will suggest ways and means of raising fresh funds for this scheme and in addition Mr. Shah who is the Superintendent of the Veterinary Department will produce some subsidiary scheme which is being worked in the province and how it has been appreciated and approved by His Excellency the Viceroy.

The Hon'ble Nawab Bahadur of Dacca : Sir, I have heard with great interest to what other Honourable Members have said. If I heard them aright, this conference was called for the purpose of gathering information from the different provinces in regard to what they have done and what they propose to do. The better course would have been if letters had been written to the departments of the various provincial Governments, then we would have been able to get a definite outline of what these provinces proposed to do. The purpose of this conference is to discuss this question amongst the Ministers themselves. Then I would have suggested that a small committee should have been appointed who would have toured the country and would have discussed the problem with different departments of the different provinces. After that this conference could have been called. It is so difficult for us to give any opinion in regard to other provinces because in a small conversation in this House, we cannot understand the problems in each province. As we have heard from all Honourable Members, the main problem is one of finance. Very good and useful schemes could be put before the conference if only we had the necessary funds. Talking about my own province of Bengal—I do not want to discuss here the Meston Award or the Otto Niemeyer report—my province has been very badly treated and we are already suffering from economic depression and it is impossible for us to suggest any big schemes on behalf of the province because there are many other more important schemes which are awaiting sanction of the Government in the province.

Some Honourable Members gave a list of what they have been able to do in their own provinces. In Bengal we have also started an Animal husbandry department. We have got district funds which we propose to close down and start provincial fund. I agree that there should be provincial fund for the cattle improvement. But I do not agree that this fund should be under the control of a committee. In Bengal at least this is an absolutely new thing and for the present we have decided that the fund should be run by the Ministry with its departmental heads. I agree that there should be a provincial committee, but its function should be of an advisory character. A non-official advisory committee will be welcome, but I do not think that for the present the funds should be controlled by this advisory committee. I also agree with what the Hon'ble Minister from Bombay said. In our province there are certain people who are presenting bulls which are absolutely of no use. Certain people are putting special restrictions that the bulls should be kept in certain selected areas. We now propose to ask these gentlemen who

present us with bulls that instead of bulls they should give us cash subscription so that it may be better utilised by the department itself.

Most of the work we have done is through the Government of India grants and if the Government of India agree to continue this grant, we will be able to do better work. I would like to say another thing. The Governments all over the world always subsidise any new venture. Here the Government of India have subsidised iron and steel. The best thing for the Government is to subsidise the thing which depends upon agriculture. If the Government of India really wish to do any good to the country, for at least five or ten years and if the Government of India want to see this department stand on its own legs, then they should give a grant. The provinces have already great demands on their exchequer and they cannot find any large sum of money for any big scheme. India depends upon agriculture. Iron and steel cannot be eaten. If India should become a nation then it is essential for the Government to develop the agricultural department and for that the animal husbandry is most important. I would humbly suggest that the Government of India do continue the grant as a subsidy for the next five years or 10 years.

Chairman : I should like to know if any of the representatives of the Indian States would like to say anything.

K. B. Chaudhri Mohammad Din : Sir, an Animal husbandry department has recently been established in Jodhpur State. The scheme was approved by Sir Olver and it has been approved by the Jodhpur Durbar. Two lakhs has been allotted for the purpose. His Highness is very keen in the matter and steps are being taken to improve the cattle breed in villages and encourage the maintenance of better stock. Marwar is famous for its Nagur breed which is known all over India. Bulls are being distributed free every year and a cattle improvement fund is going to be set up for the maintenance of such bulls out of the village malba fund. We are very thankful to you, Sir, and to Sir Olver for the very valuable help and guidance given to us. I hope we will make it a success in the State. We have got a grass farm section in the animal husbandry department and the area under grass farm is 15,000 acres at present and it is hoped to increase it by another 6,754 acres making thus a total of about 21 thousand acres odd. A scheme is under consideration to increase the output of grass farms.

Chairman : I forgot to call upon the Hon'ble Minister from Sind to speak. I apologise to him.

The Hon'ble Mir Bande Ali Khan : I thank you, Sir, for giving me an opportunity to speak on behalf of Sind. Hitherto Sind was kept with the Bombay presidency and as such very little efforts were taken in the direction of improving cattle breed. Sind is predominantly an agricultural province. We have got one of the biggest projects, the Lloyd barrage project. The future cultivation of crops in Sind depend entirely on a good breed of bulls. For this purpose we must try to improve the cattle breed. Sind is not a rich province. It will not be possible for us to carry on this scheme unless we are given some subsidy from the Government of India, because indirectly Government of India also benefit if our agriculture improves. Although Sind is a poor province, yet we have district committees which were able to collect about Rs. 14,000. We want now to start

a provincial cattle improvement fund under the presidency of H. E. the Governor of Sind with officials and non-officials as advisers and if we are able to collect substantial subscription, we would like to utilise that fund and the interest accruing therefrom on the improvement of cattle. We have got in Sind three good breeds of cows, one called the Thari, the other, the Karachi and the third is the Bagnari. We are having these three in different tracts and we shall improve these breeds. We should also like to engage one livestock officer because it is essential to have one expert to supervise and advise the people and also the agency under which this department will be working.

Sardar Jarmani Das : There has been a very satisfactory response to the appeal of H. E. the Viceroy for setting up a cattle improvement fund in the Patiala State. His Highness has set aside over half a lakh for this purpose with which bulls will be bought and distributed in the villages, and the peasants and cultivators have agreed to buy these bulls at half price. So the Government as well as the people have responded to H. E.'s appeal. Then, His Highness has from his own privy purse started bull breeding in the State. Recently Fresian bulls and cows have been imported into the State for breeding purposes and it is hoped that in a short time the cattle breeding on scientific lines will be in full swing. It is also contemplated by His Highness' Government to open Dairies on commercial lines in most of the important towns of the State and this will give further impetus to good breeding of cattle. Not only have we thought of the plains, but His Highness has got over a hundred cows and ten bulls of Koh-i-Damni breed from Afghanistan which we have distributed in our hill territory, and they are doing very well. They are of the same size as the cows and bulls of Simla district but with twice the yield. They yield 4 to 6 seers while the Simla hill cows yield only about 2 seers. Board of Agriculture composed of expert officials and non-officials with Secretary, Forests (Minister in charge of Agriculture) as Chairman and Director of Agriculture as Vice-Chairman has been formed recently before which board, schemes for cattle breeding are laid for discussion and advice. His Highness is doing everything possible to improve cattle breeding in the State, and we employ efficient and capable men trained in foreign universities to take up this work. I think we are far ahead of many other States in this respect.

Mr. K. R. Narayana Iyer : Sir, as soon as His Excellency's appeal was issued it was translated into the local vernacular and bulletins were distributed in large numbers but in spite of our best efforts the response for donations and subscriptions was not satisfactory. But at the same time the Government of Travancore recognising the great importance of cattle improvement in the State sanctioned a small Scheme for grading up the cattle in the town of Trivandrum, the capital of the State as a first step in this direction. Five good Sindhi bulls have been got down and stationed at five different centres within the municipal limits of the town. As a result of the experience gained by us so far, it has been found that of all the breeds of cattle tried in the State, the Sindhi thrive fairly satisfactorily withstanding climatic conditions to a certain extent. The cows of this breed have also been found to be regular breeders and heavy milkers.

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Department. The bulls will

present us with bulls that instead of bulls they should give us cash subscription so that it may be better utilised by the department itself.

Most of the work we have done is through the Government of India grants and if the Government of India agree to continue this grant, we will be able to do better work. I would like to say another thing. The Governments all over the world always subsidise any new venture. Here the Government of India have subsidised iron and steel. The best thing for the Government is to subsidise the thing which depends upon agriculture. If the Government of India really wish to do any good to the country, for at least five or ten years and if the Government of India want to see this department stand on its own legs, then they should give a grant. The provinces have already great demands on their exchequer and they cannot find any large sum of money for any big scheme. India depends upon agriculture. Iron and steel cannot be eaten. If India should become a nation then it is essential for the Government to develop the agricultural department and for that the animal husbandry is most important. I would humbly suggest that the Government of India do continue the grant as a subsidy for the next five years or 10 years.

Chairman : I should like to know if any of the representatives of the Indian States would like to say anything.

K. B. Chaudhri Mohammad Din : Sir, an Animal husbandry department has recently been established in Jodhpur State. The scheme was approved by Sir Olver and it has been approved by the Jodhpur Durbar. Two lakhs has been allotted for the purpose. His Highness is very keen in the matter and steps are being taken to improve the cattle breed in villages and encourage the maintenance of better stock. Marwar is famous for its Nagur breed which is known all over India. Bulls are being distributed free every year and a cattle improvement fund is going to be set up for the maintenance of such bulls out of the village malba fund. We are very thankful to you, Sir, and to Sir Olver for the very valuable help and guidance given to us. I hope we will make it a success in the State. We have got a grass farm section in the animal husbandry department and the area under grass farm is 15,000 acres at present and it is hoped to increase it by another 6,754 acres making thus a total of about 21 thousand acres odd. A scheme is under consideration to increase the output of grass farms.

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In accordance with this Scheme, each bull will be under the charge of a bull keeper appointed by the Agricultural Department. The bulls will

be mated only with selected cows which are in prime condition, of well built body and which are free from the attack of chronic or infectious diseases. All the cows which are found fit to be mated with the bulls, will be registered under the Scheme and certificates of registration will be issued to the owners of all cows that come up to the standard. The milk yield and other characteristics of these cows will be recorded in a special register to be maintained for the purpose. A history of the calves that are born to the registered cows will also be maintained and the cow calves when they attain maturity will also be brought under the Scheme. To avoid contamination every effort will be made to remove the scrub bulls from the scene of operation.

To encourage cattle improvement in the rural areas the Government award every year a certain number of grants for the maintenance of stud bulls by private owners and there is a proposal to raise this number from 15 to 30. Four Cattle breeding co-operative societies have also been organised in different parts of the State and one of them is managed and run exclusively by women. These societies do very good work and the milk and dairy produce from each of these societies are sold in co-operative sales depots specially opened for the purpose in the nearby towns. Periodical Cattle shows are also held in various parts of the State and prizes are awarded for the best specimens of cows and bulls exhibited.

His Highness the Maharajah and Her Highness the Maharani take a deep and abiding interest in the matter of improving the cattle of the State. The Palace Dairy Farm maintains an excellent herd of Sindhi cows and the daily average of milk yield for the cows in lactation is from 28 to 30 lbs. The stud bulls in the Farm serve the cows of the public for a nominal fee. Calves of Sindhi cows are also sold from here at cheap prices. This Farm is doing pioneer work in the popularisation of Sindhi cattle in the country. The possibilities of growing Napier grass, Guinea grass, etc., and using them as cut fodder for cattle are also being demonstrated on a large scale by this Farm.

Thus everything possible is being done for the improvement of the cattle in the State but the problem that we have to face on account of the heavy rainfall, warm humidity and the comparatively coarse fodder that we have, is entirely different from what it is elsewhere in India. I would, therefore, request the Imperial Council of Agricultural Research to view the problem here and in Malabar in a different light altogether and do what is necessary for the improvement of our cattle. We have no special breed of cattle at all in the State at present and the cows and bullocks which are puny in size belong to an entirely non-descript type.

Mr. V. L. Wazir : The Kashmir Government have taken special interest in the problem of cattle improvement and have been getting expert opinion from outside also. At first these efforts were on a small scale, but for the last two years we have taken up this question in right earnest. Under this scheme, ten centres located in different provinces are being selected with a view to have comparatively good grazing and the cattle are of a better type. In these centres it is intended to register the good stock and castrate the unsuitable ones. The bull suited to the locality will be given to an agent selected from among the zamindars who

will be given about Rs. 8 to 10 per month for the maintenance of the bull. We have already purchased bulls and the cows are registered in the centres. These centres will be like small demonstration farms, so that people near about can take lessons and take up this problem on their own. In order to remove any trouble which the people may give us about the castration of unsuitable bulls, we have framed a Bill on the lines of the action taken by the Bombay Government, which will come up in our Assembly in the next session and by which we will be empowered to effect compulsory castration in these selected centres to begin with. Then in the surrounding villages we are going to castrate the bulls and have only a selected number of bulls that will be given any license. These licensed bulls alone will be allowed to breed. This in a nut-shell is our scheme. We have purchased bulls already and Rs. 17,000 has been allowed by Government. It is of course a small amount but our Government is in right earnest about it. We have of course to face difficulties in the shape of religious sentiments, etc., but the Government realise that the time has come to take steps so that the agriculturists may benefit.

As to the question of raising funds we have not taken up the subject as yet because we thought the Government should first do something substantial to show to the people what their interests are and we have given effect to this scheme. We will soon appeal for public funds and people can then come forward and help us. We have recently formed a Board of Agriculture composed of expert officials and also non-officials, *e.g.*, the Director of Agriculture and the Registrar of Co-operative Societies and the Governors of two provinces, with the Honourable Revenue Minister as Chairman. When I go back from here I will suggest a discussion of this question by this Board.

Mr. R. C. Woodford : In Assam we realised in very early days that no permanent good could come from the Viceroy's appeal unless it took a permanent form ; and as a result of that I think the suggestion for the formation of provincial livestock improvement associations first came from Assam and we were actually the first to form such an association. I regret that we have not sent in this information to the centre ; the paragraph on Assam in the printed note is at least nine months out of date. The present constitutional position of our livestock Improvement Association is that the Governor of the province is the President, the Minister of the department dealing with livestock is the Vice-President and a member of the Governing Body ; the Secretary of the department is a member of the Executive Committee. So that Government is well represented. On the Executive Committee are the Director of Agriculture, the Superintendent of the Civil Veterinary Department and myself ex-officio as the livestock officer ; also there are three or four non-officials elected from the Association to the Executive Committee at the centre. The present position of the Association is as follows : A fund of Rs. 25,000 has been established ; it has nothing to do with departmental grants for livestock, but entirely owing to the Viceroy's appeal. Sub-divisional branches have been formed in all Sub-divisions with their own executive committees of which the Deputy Commissioner of the district is the ex-officio President and the Sub-divisional Officer the ex-officio Vice-President. The Chairman of the Local Board is also ex-officio Vice-President, provided the local board gives a certain annual subscription. All veterinary assistant surgeons and livestock inspectors throughout the province

are ex-officio branch secretaries. That means that they are the men who will really do the selection and registration of breeding bulls under this Association scheme. The membership up till now is 600 permanent subscribing members. The Association has been registered as a society under the Act of 1860 giving it a permanent form. A memorandum of Association has been printed and filed ; rules have been printed and issued to branches, and a general plan of action has been prepared to co-ordinate the action of all branches. The first plan aims at the selection and registration, and, where necessary, the subsidising of 2,000 bulls, and there is not the slightest doubt that under the present organization we can do a great deal. The response in actual bulls in response to the Viceroy's appeal was over 300. All these have been handed over to the branches or the subdivisions from which they were presented, and the money collected at the centre under the Viceroy's appeal has been redistributed to the subdivisions from which it came. Of course every one likes to spend the subscriptions collected in his own area. That is how we stand in regard to the Viceroy's appeal question at the present moment.

Mr. F. Ware : Sir, I have to apologise for an error that seems to have crept in our note that was prepared for our agenda, but we did not have time to find out what the latest position was, and these remarks are based on the information provided by departmental officers at the last meetings, partly in Madras in December last and partly in Delhi in January last, and I do hope you will accept my apologies.

Referring to the discussion on this subject, Sir, we have heard a lot of interesting information from the different provinces as to what is being done with regard to cattle breeding. Only, as was to be expected, possibly the question of finance has taken a major part. I think it has been raised by every province except Assam, and when I say finance, I mean financial help from the Government of India. I am not in a position to say if the Government of India would be prepared to make any contribution in this scheme of work, but I think I may say that if the Government of India are ever in a position to be able to do so, they will require to know that this money is going to be properly spent and administered, and for that reason I would like to draw your attention to these three points which were put forward at the beginning of this discussion by Sir Bryce Burt in regard to this item on the agenda, for if we could come to some agreement on these three points, we would have gone a long way towards providing for the distribution of funds when they become available. I would remind the House what these three points are—(1) the establishment of cattle improvement funds, (2) the nature of the provincial organization for the administration of that fund, and (3) its relationship to the several Ministries of Agriculture and to the expert officers concerned with livestock improvement.

Before I sit down, Sir, I should like also to draw attention to an item of detail, which is an important detail, which is included in our Note on this subject. In the Note by the I. C. A. R. which is before you it is laid down—"The Livestock Improvement Sub-Committee of the Animal Husbandry Wing, which met at Madras in December 1936, went a step further and recommended that in future no gift of a bull should be accepted unless it is accompanied by suitable provision for maintenance". Actually, Sir, I was not in this Livestock Improvement Committee, and

so I did not hear the discussions which took place at that time, but I understand that some real difficulties have been experienced in at least some of the provinces in connection with H. E.'s scheme. Most Livestock departments or sections in the provinces have made out schemes for the province and the different parts of the province, and naturally they only want those bulls which suit their schemes well locally in those districts. I understand what is happening in some provinces is, that some kind gentleman comes forward with a bull and wants it to be placed in a certain village where it does not fit into the general scheme. In order to get over the difficulty, I think all technical officers will agree with me that any gift of a bull should be made only with the approval of the Livestock department, and I hope that we shall be able to get that on record. If you agree with that proposal, then it will enable me to raise another point that has exercised my mind for a good many years in India, and I expect it has exercised the mind of many others too, and that is, is it possible to make any use of the long established custom of presenting Brahmini bulls? The Hindu community generally wishes to present their Brahmini bulls, but these bulls should first be approved by the Livestock department of the province. That will help us to make great use of this old custom, and I am rather hoping that possibly some in the House will support me in that.

It was stated, I think, by the Hon'ble Member from Bengal that in his own province instead of private gentlemen donating bulls, they are trying to persuade them to donate cash. That of course is, I think, the obvious line. If this work of cattle improvement is going to be supervised by the Livestock Department, it will be far better for the Livestock Department to have more cash and buy what bulls they want. But the other point we have got to consider is the question of their maintenance, and I think that in this room opinions are divided as to what form the maintenance should take. In fact, I believe in some provinces there is a distinct feeling that no maintenance grant should be given for breeding bulls, that it is far better to try and encourage the independent spirit of the ryot, and to tell him that if he or his friends want a bull, they must arrange to maintain it. On the other hand, as you have heard, in some provinces maintenance grants are made. It will not be possible therefore for us to get uniformity in this matter, but I do think it is very important that we should have uniformity in each province, i.e., it would not do if a ryot in one village is given a maintenance grant and in an adjoining village he is told he cannot have one because his bull comes from some other source, but I think that if my first proposal is accepted, i.e., all gift bulls should be approved by the Livestock Department, this difficulty will be removed, because they will be maintained from the same grant as the Government bulls are maintained.

Chairman : Would any official or non-official like to speak ?

Mr. B. K. Badami (Hyderabad) : Sir, I am not asking for any grant from the central Government, because we have enough money to carry this programme of work. But I wish to make one or two general observations from the experience we have had during the 25 years : I can say that while enthusiasm for increasing cattle breeding farm is good in its own way for research work and for the supply of a few bulls, the private breeders should not be overlooked in any scheme of cattle breeding. We know that in some parts of the country there are many private breeders who

have got great experience in this line. Government farms alone cannot provide all the bulls that are needed. Some of the best cattle, one sees, are bred by private breeders in the country, and quite a large number of these are hereditary breeders. If some of them are not taking sufficient interest now, they may have some difficulties in regard to grazing for cattle or assessment on land or other difficulties. This is a matter which requires the serious attention of competent authorities. Except in a few places the cattle breeding farms are in out of the way places or far away from the natural home of the breeds, and what is turned out may be called 'hot-house' bulls. H. E. the Viceroy said this morning that the wellbeing of the ryot depends on the livestock of the country. This reminds me of a recent instance in Hyderabad that in one of our districts the Collector asked for bulls. But I had not to depend on private resources and my Government sanctioned enough money. Ten bulls were distributed experimentally. The Revenue Department also suggested offering a large sum to buy agricultural cattle for the ryots and for cattle breeding and to provide breeding bulls in the villages. This led me to inquire how far we could do this. An intensive inquiry was set on foot in 21 villages watered by canal irrigation. Cattle were examined in detail, and we found that 60 to 70 per cent. of the cattle in those villages suffered from liver flukes. Out of the 10 bulls I had distributed a year ago, it was found that 4 or 5 of them were already suffering from liver flukes. I feel that in trying to make any improvement in regard to cattle, it is most necessary to make a provision for adequate veterinary aid, without which there will be no good done. I feel there should be provincial and State advisory boards to deal with livestock improvement consisting of the representatives of the Revenue, Forest, Co-operative, Industrial, Agricultural and Veterinary Departments who should take active part in concerting measures to ensure success. Non-official gentlemen who evince live interest in livestock should be associated with the advisory Boards. Sir, without their co-operation, we will be no where, and when this is done, it would be possible to show definite progress. We are having all the funds that we want in Hyderabad from Government and we have not tapped private resources yet. I know there are very enthusiastic zemindars in Hyderabad who would offer bulls, but the trouble one experiences is the same as Mr. Ware has described. Private associations are needed and I also feel whatever committees or associations we may have, the help and advice of non-officials who are really interested in cattle improvement and are themselves either cattle breeders or big zemindars, would be most desirable. All executive work must be in the hands of one department, the livestock department, or the veterinary department, or any other department—I may be partial to my own department, but I think it is the most suitable department which can take on the work, and I have no doubt that with the advice and help of other departments we ought to make it a success provided that, in His Excellency the Viceroy's words, "There is a continuity of policy and control and method substantiated with necessary funds".

Lt.-Col. Noel : The speakers up till now have stressed the financial side of the problem. They have stated unanimously that there is no possibility of raising enough money from provincial sources. I propose to throw out one or two suggestions as to how money could be found. You are well acquainted with the principle of the cess. We have a cess on the

on cotton and other commodities and it is admitted that they work well. The proceeds of the cess are devoted to the development of the industry concerned. Up till now the levy of a cess has been the prerogative of the Central Government, but under the new constitution it will be a provincial subject. Every province can levy a cess on any commodity it likes. In the case of N.-W. F. Province, if we put eight annas on every bullock which comes into the province we can raise Rs. 40,000 which is twice as much as we are spending on cattle subsidies scheme. That is one suggestion.

Another is as follows. In some districts a tax is levied on animals which are brought to cattle fairs and are sold. There is a great diversity between the rates of taxes levied. I have been looking into the figures and find that it varies up to 3 per cent. of the sale value. I suggest that the Provinces should rationalise the levy of the taxes and get the District Boards to agree to accept a share somewhere in the neighbourhood of what they are getting at present and allow the rest to be devoted to cattle breeding. In this way a handsome amount could be raised. In the North-West Frontier Province all subscriptions have been in cash and bulls have not been donated. The problem of utilizing subscriptions is therefore simplified. Moreover our task in the N.-W. F. Province is rendered still easier by the fact that a source of breeding bulls has been made available. This is due to our subsidy scheme which has been running successfully for seven years and now numbers 240 stud bulls—no mean number for a small Province like the N.-W. F. P. From the progeny of these bulls we are already having new recruits as stud bulls.

Babu C. L. Kanoria : I have much pleasure in supporting my friend, Mr. Ware. I am grateful to him in bringing the matter of Brahmini bulls before the Conference. It will help in the improvement of bulls. I have got nothing else to say. Arrangement should be made for those bulls which are wandering in the streets and for which nobody seems to care.

K. B. Nawab Chaudhri Muhammad Din (Jodhpur) : As regards Mr. Ware's proposal about Brahmini bulls I want to say that we have in Jodhpur already taken steps to guard against undesirable bulls. They are being segregated in a reserved area which His Highness has graciously placed at our disposal. As for the future, His Highness has passed orders that all bulls intended for dedication should be duly inspected by the Department and approved by it.

Sir Madhorao G. Deshpande : On behalf of the non-official members I must first of all thank the Central Government for allowing us to take part in this discussion. I have heard with great pleasure the speeches made by the Hon'ble Members of provinces and other gentlemen. I find that the difficulty of the Hon'ble Members is finance. But from the Indian States I have not heard this complaint. I do not know the reason why there should be this difference, why our Governments should be short of funds. No one from the States has stated anything about the finances. Government generally complain that agriculturists are very extravagant and do not know how to spend money. But here I find from the spokesmen of the provinces that they have got no funds. As regards the condition of agriculturists you are aware that during the last 5 or 6 years they have been badly off. They are not in a position even to pay the land revenue to the Government. So, if you expect at this stage any financial help from

them, it will be useless. Secondly there is the question of control. At present in the C. P. we have distributed the bulls and their management is given to some of the leading members of the village. I do not know how far this will be a successful scheme because everybody's property is nobody's property. If you do not give the bull to a particular individual, then I doubt whether that bull will be kept in a good condition. I, therefore, suggest that the management should be given to the veterinary department and the bull should be inspected now and then. We have got a premium scheme, but it has not been given effect to. I think it should be encouraged if the Government wish to come to the help of the cultivators.

Mr. P. J. Kerr : Many of the speakers have referred to the distribution of the bulls, but very little stress has been laid on the necessity, and it is very urgent, for supervision as to the care afterwards not only of the bull but also its work and services. First of all, there is the selection of the person who gets the bull, and after that, you have to see that he carries out the obligations which he undertook when he took the bull. This applies also to Mr. Kanoria's suggestion about the utilisation of Brahmini bulls. Very excellent Brahmini bulls were donated, but they were let loose, and, as was said, everybody's property is nobody's property, and the best bull may degenerate. Only suitable Brahmini bulls should be donated and they require selection, and they should be given to the livestock officer or the livestock organisation of the province or State. They should be placed where they are required and after that, they should be supervised for their health and welfare. Money for maintenance is another point, and there I differ from a good many other people. I do not think if this scheme is to be a success you can make a difference between those originally purchased and distributed for which maintenance is granted and the progeny which will afterwards be brought in for further distribution. As an alternative to this, in order to make it possible for the real genuine cultivator of a small holding to take bulls, bulls may be presented in pairs and that I think is worth consideration. The bulls can do their full day's work if they are properly fed and their full year's service as well ; it is only a matter of feeding them properly. There is one other point about which I have thought very seriously for a long time and that is finance for the provincial animal husbandry schemes. I have already submitted a note that a cess should be levied, not at fairs, but on every adult cattle beast in the province ; it might bring a million rupees at one anna cess per head in Bengal but that has not been accepted because it is direct taxation on the ryot. I do not think this is sound argument, because all money that we get in the provinces as revenue practically comes from the ryot and his labours.

Mr. W. J. Jenkins : I should first like to deal briefly with one or two points which had not arisen when the Hon'ble Minister for Agriculture for Bombay made his speech, namely, with regard to the three points which were enunciated by Sir Bryce Burt at the opening of the meeting. As regards the establishment of cattle improvement funds, we have already found out from the discussion that has taken place, that in many provinces, such funds, or the nuclei of such funds already exist, and the intention is not to allow these funds to lapse, nor to allow the interest which has been aroused in cattle improvement to dwindle, but to have some permanent body to control and administer these funds in future. I think I may say that we in Bombay were very much struck by the organisation which has

been established in Assam and which was so briefly and succinctly described by their Live Stock Officer. We feel very definitely that two points must be observed. Firstly, that any Cattle Improvement Association upon a provincial basis must be founded on district branches and in that way and in that way alone can we hope to maintain local interest in the work and deal with local problems in the way that people in the districts require. We also feel that a very close association should be maintained between any such Association and the Minister in charge of Agriculture or in charge of livestock improvement. I think I have my Honourable Minister's agreement in saying that he thoroughly agrees with the suggestion that His Excellency the Governor should be the President and the Minister in charge should be Vice-President or, if His Excellency is not the President, then that position should be taken by the Minister of Agriculture. I also agree with one speaker who mentioned the necessity of enlisting the co-operation of the Forest and Co-operative Departments in this work. I feel personally that the greatest development of cattle improvement is going to take place through co-operative organisations. That deals very briefly with the question of the establishment of funds, the nature of the organisation and the relationship of such organisation to the Ministry of Agriculture.

With regard to maintenance of stud bulls that is the matter in which we have found the greatest trouble. To begin with we cannot rely on giving bulls to people who would maintain them free and I submit that, in many ways, it is undesirable that people should be asked to maintain these bulls free. For one thing, the Agricultural Department, or the department which is controlling the registration of the progeny, has a very much better hold over the agents if a certain amount of subsidy is given. I notice that in the I. C. A. R. note, a suggestion is thrown out that this registration should be done by the agents themselves. I say that is definitely impossible. This will have to be done by some official agency and, although I have not the Honourable Minister's agreement in this suggestion, I think the work connected with the registration of progeny should be a legitimate charge on any cattle improvement fund in the province. The question of utilising Brahmini bulls in any scheme of livestock improvement is not going to be such a simple thing as has been suggested and I think that probably some form of legislation will be necessary before this could be definitely done.

The Hon'ble D. B. Sir S. T. Kambli : With regard to the work of registration, I think it must be undertaken by some official agency.

Khan Sahib S. M. A. Shah : In the North-West Frontier Province there are many areas where there is not enough fodder. So we have surveyed all our districts and earmarked the areas for the purpose of cattle improvement. The zamindar who is really keen on the improvement of cattle deposits Rs. 50 for the purchase of the Bull. The rest is paid by grant from the district board. Subsidy allowance is fixed at the rate of Rs. 8 p. m. from the date of location and no cash payment is made by the District Board until the advance is paid off. Then the zamindar becomes the owner of the bull and is entitled to a cash subsidy allowance of Rs. 8 p. m. from the District Board in return for the service of the bull. He maintains two books. In one he records the coverings and in the other he records all the produce. And the counterfoil is given to the bacha, so that if the bacha is sold, the seller gets a better price and so we have an

accredited progeny. For maintaining livestock accounts, we have got stockmen whom we give six months training at the Central Veterinary Hospital, Peshawar, and we give them Rs. 25—1—35|2—50. They go about touring in villages and they prepare monthly returns which are sent to the Veterinary Department and the District Board. A register is maintained in every Veterinary Hospital showing the number of bulls attached to the hospital as well as the total coverings of each bull. We have a pukka check on the amount of subsidy that we are spending. At the end of the month we send an acquittance roll to the district board for payment. In case the service of the bull is unsatisfactory or his condition is not well maintained by the zamindar, we always have deductions. For instance, instead of 8 rupees, we recommend 6 or 4 and so on. We have a proper check on the whole scheme. Then we have another form in which the results of the last five years are recorded by the inspecting officials. They contain the name and designation of the Inspecting officer, date of inspection, name of Darinda, location of bull, date of entertainment, monthly subsidy, present age of bull, physique, number of coverings, fertile, infertile, abortion, bull calves, cow calves, sold before calving, died, unaccounted for, names of villages in which coverings and produce checked, number of entries checked and result, number of castrations performed last year and age at which performed, number of local bulls in the village where subsidy bull is stationed, how many cows are there and general remarks. We have therefore a pukka check on the work of our bulls. This scheme was submitted to His Excellency the Governor of the North-West Frontier Province who forwarded it to His Excellency the Viceroy and here is an extract from His Excellency the Viceroy's letter :

The plan of subsidizing stud bulls which has been evolved in the North-West Frontier Province seems to me to constitute a very valuable contribution towards the technique of cattle improvement. I know of no reason why it should not prove as successful in other parts of India as evidently it has with you and I propose carefully to consider the expediency of recommending it for trial in other provinces. I am much attracted by a plan that (a) avoids something for nothing and (b) makes the approved stud animal appear to the public as a cultivator's animal and not a part of Government, and (c) combines the advantages of (a) and (b) with a sufficient measure of continuous control by the Veterinary Department.

Sir Bryce Burt : If I may sum up the discussion that has gone so far, it seems to me that there is on the whole agreement on three main points. In the first place I think there is a very general agreement that there is to be established in each province and State a provincial cattle improvement fund and funds will be raised for the improvement of cattle by un-official effort. I should like to repeat what I said at the beginning that we are dealing mainly with money which is raised by un-official effort and by close association between Government and non-officials. Government alone can do far less with cattle than it can with crops. That is the experience in practically every country and after 30 years experience in India I have often felt that if there is one thing for which you can raise money it is for cattle improvement and I do feel that the provincial cattle improvement funds will be able to get a steady, if not large, stream of money to supplement what Government itself provides.

As regards the administration of this fund, there also there seems to be very general agreement that though in some provinces an association would be a more suitable form and in others a Board, there should be a close liaison with the ministry, that the Minister himself should be either the President or the Vice-President and also that the livestock officers and veterinary officials should be closely connected with the executive of the Board or association as the case may be.

There is also a strong body of opinion that any such association or board must be based on district branches, so that you might have the enthusiasm in the districts and the money collected in the district is sent back to it for its being utilised there. We are not suggesting any contribution to the centre whatsoever. One or two speakers felt obliged to protest that such a suggestion should be made. No such suggestion has been made and I think the suggestion which was made by several speakers that the district should receive back the greater part of the contribution to the provincial fund is a very sound one. On those points there does seem to be practical unanimity.

There remain two points—maintenance and registration. I do feel that the registration of pedigree stock and progeny is a most important step. His Excellency the Viceroy referred to it this morning as being very essential and I feel that provincial associations or boards should give attention to that point. We cannot hope to lay down a procedure for the whole of India. That must be left to the provinces and states. If I have correctly stated the conclusions of this conference, as I hope I have, then we will put forward a formal resolution embodying these conclusions tomorrow for your consideration and acceptance.

The Hon'ble Nawab Khwaja Habibullah Bahadur : There has been practical unanimity that the Government of India should contribute and help the provinces. I hope you will put that also in the Resolution.

The Hon'ble Chaudari Sir Chottu Ram : With regard to the creation of provincial committees, I think that no administrative functions should be assigned to them. I must make my own position clear in this matter. I am absolutely clear in my own mind that no administrative functions should be entrusted to these committees. They will consist of officials and non-officials who will come into conflict with the party in power and friction will result. So I am definitely of opinion that in the Punjab no administrative functions should be assigned to these committees.

The Hon'ble Nawab Khwaja Habibullah Bahadur : I agree with what the Minister from the Punjab has said.

The Hon'ble Mr. Gora Chand Patnaik (Orissa) : That may be the experience in the Punjab but in other provinces it is altogether different. In matters like this officials and non-officials should co-operate. I do not think there will be any difference of opinion. The officials should be taken in some proportion. Then it will be allright.

At this stage the Conference adjourned till 10 A.M. on Wednesday, the 26th May 1937.

The Cattle Conference met at 10 of the clock in the Council Chamber of the Viceregal Lodge, Simla. The Honourable Kunwar Sir Jagdish Prasad, presiding.

Chairman : We shall now take up item (2) of the agenda.

Mr. E. A. Smythies : The excellent note which the I. C. A. R. has prepared on this item of the agenda distinguishes between three types of lands, lands under the forest department, other waste lands and cultivated land. I propose to follow this very convenient classification and to make my remarks on each of these three items separately. The note at the commencement emphasizes that where the general plan for improvement of fodder and grazing was recognised the subject bristles with administrative difficulties. I assume therefore that this conference will be considering these administrative difficulties or some of them and try to find ways and means of overcoming them. Finally the agenda mentions appropriate agencies. Therefore I think for each of these three types of lands, we shall have to consider two points, firstly, what are the difficulties and secondly, what are the best agencies of overcoming them. I might mention that the first two types alone cover 65 per cent. of the total area of British India. This gives us some indication of the immensity and importance of the problems that we shall be discussing to-day.

Dealing first with the areas under the Forest Department, the preliminary report of a meeting at Madras distinguish between two types, the moist type and the dry type. The moist type is typified by the Terai, the Ganges valley and similar areas of perennial grass. This type does not give us any very serious problem to tackle. We can say of it that the more the cattle the merrier and the more the better fare because it is only by heavy grazing that the grasses are prevented from becoming coarse. In fact towards the end of the rains and in the earlier cold weather, grass is becoming too coarse for fodder anyway and the amount of grazing at that time almost becomes negligible so that the cattle have either to migrate or to live on straw fodder or to be fed on leaf fodder. There is no serious administrative difficulty in that type of area. The dry type is far more important as being the predominant type in all the provinces of India. In this dry type, we can say definitely that improvement of grazing and grass follows almost automatically by control of the grazing, by control both in time and incidence and that no improvement is possible without adequate control. Hence the problem boils down to an administrative problem, *i.e.*, how to institute and obtain adequate control. The report of the Madras meeting dealt with five provinces in detail and I do not propose to cover that ground again. It is obvious however that some provinces are fortunate in being able to have some control over village grazing in forest areas. They can limit the numbers, they can limit the time, they can introduce rotational closure and rotational grazing. The improvements which follow are well-known. A classic example is given by the Bombay Presidency and I am sure Dr. Burns will have some valuable information to give us. But other provinces are not so fortunate. In the Punjab in particular and in the Kumaon hills of U. P., the forest departments are helpless to introduce any improvements in grazing because the forests are burdened with uncontrolled and unlimited free right of grazing. It was suggested at the Madras conference that as control is essential, where necessary it should be given by legislation. This is a very big subject and a very big problem and it must be remembered that these long standing rights were themselves created or given by legislation, that is to say by the procedure laid

down in the Indian Forest Act in various settlements and where as in part of the Punjab, it can be shown that grazing rights are not only destroying the forests but also resulting in tremendous erosion of the land itself, there is I think possibly a case for legislation to over-rule the forest settlements in the interests of a wider section of the public ; but where it is only a question of improving the grazing, I do not think now-a-days it is practical politics to suggest legislation to over-rule the various forest settlements. I think the only alternative open to us is to do what we can by persuasion and propaganda and voluntary co-operation of the surrounding villages and graziers. It is however clear that the problem takes a different aspect in different provinces and therefore we cannot come to a single all-India solution at this meeting. This subject will have to be examined provincially. The note of the I. C. A. R. makes the following remark :

“ It seems to be the intention of the committee ——”.

This is referring to the Madras meeting,

“ that the initiation of further measures of improvement should be left to the Forest departments, but it would appear desirable that the standing fodder and grazing committee which is recommended for each province under Part II of the report, should be in a position to make recommendations and give advice in regard to the treatment of the areas.”

Well, Sir, I entirely agree with that and I suggest that it might come in as Resolution on this item.

Before leaving the subject of areas under the Forest department, there is one more point I would like to make. Page 9 of the note says :

“ That proper management must involve expenditure which will not be immediately remunerative, and from which even the ultimate returns will very probably be mostly indirect. The mode of provision of the necessary funds must be decided by Government. Such expenditure should not be imposed as a further burden upon the budgets of commercial or quasi-commercial departments.”

The note does not make any further reference to that point, but it is really a very important one. The forest department in most provinces is regarded as a commercial department and to a considerable extent our efficiency is judged by our surplus revenue over expenditure. If therefore the forest department should enthusiastically take up schemes for improving fodder and grazing, it will cost money, but will not produce revenue and it would automatically reduce the criterion of its efficiency. I think if it is possible to follow the analogy of the fodder operations, the cost is never debited against the various commercial department budgets but it is shown under a separate head. If something like that could be done for any work undertaken by the forest department in improving fodder or grazing—which is not commercial—it would have considerable effect and enable the forest department to take up schemes with greater freedom. The question as to who is to provide these funds is a very big matter. It has already cropped up in this conference and I will refer to it again briefly later on.

Turning now to the other waste lands, such as usar, ravines, the rocky hills of central India, the shamlat and village grazing grounds generally—

these by their very size alone are extremely important and they have to bear the brunt and the burden of grazing of India and at present, I think, practically everywhere, there is no control and no method of management over them. They are generally of the dry type and therefore the primary problem is identical with similar type of dry lands under the forest department, that is to say control the grazing and improvement will result, and without control no improvement is possible. I should like to emphasize that both in forest areas and other areas if we are to have control, further research and investigation is very necessary to ensure the best results, for example the improvement of better fodder grass was mentioned by His Excellency the Viceroy in his opening speech. But without control nothing can be done because if you introduce fodder grass and if they are to have a chance of survival, control is a fundamental factor. When we turn to consider the agency of control over these waste lands which do not belong to Government we are up against one of the most important and difficult problems of this conference and I have at present no solution for that. I think it is obvious from the very scale of these areas that direct Government action is not possible, as I have suggested, in the case of the Forest Department. I would like to give an illustration to show what a gigantic scale it is. In the United Provinces the Forest Department have careful plans and estimates and schemes for producing fodder in famines and if a calamity struck the province and we were told to go all out and produce what fodder we could possibly do, the total in the season would be about 50,000 tons. You can visualise what a gigantic haystack it represents. Put that way, it seems quite a lot but if we look at it in another way it does not come to much. It will supply the cattle population of the province with fodder to keep them going for about 8 hours because it works out to about 2 seers per head. My point is that if the Forest Department with all its resources working for months can only produce a few mouthfuls of fodder per head of cattle, it is not possible that Government, acting directly on other waste lands where there is no Government organisation, can do anything which will have a serious effect on the total fodder requirements of the province. That improvement will follow from any sort of control is evident. As an example, I will mention the experiment of usar, which is noted in the report of the Madras Conference which was carried out in the United Provinces on scientific lines and we found that closure to grazing in the rains with uncontrolled grazing afterwards increased the fodder supply about five fold. It is a steady increase from year to year. Similar evidence of improvement is available from ravine lands both in the Punjab and in the United Provinces and in other provinces on different types. I think that this problem also will have to be tackled on a provincial scale and therefore it will be best for the Fodder and Grazing Committees in each province to explore the possibilities and examine other agencies, the work of Government being limited to possibly two administrative areas in selected localities. I would just refer to one more point in the note. On page 2 it says: "These Committees will undertake the reclassification of waste lands outside Government forests." I do not think it is a practical proposition for the Committees to undertake that reclassification. That is essentially a matter for the Revenue Department working through the Patwaris and on the Patwaris' village maps. They could guide how it should be done but I do not think they can themselves do it.

Finally, we come to surplus cultivated land. To a great extent this overlaps Item 4 of the Agenda and I think both these items will have to be considered together. I am therefore only making one point now. In addition to growing fodder crops, I would urge that the possibility of growing tree crops should also be considered. These tree crops for fodder will supply green leaf fodder. In several parts of the United Provinces and in other parts of India the Forest Department have a considerable experience with the system of forestry-cum-agriculture, which is called Taungya. Attractive land is given out to cultivators to cultivate their own rabi and kharif crops and they are supplied with seed of suitable forest species which they sow in lines of 15 or 20 feet apart. As they attend their crops, they also attend these seedlings. After three or four years these seedlings grow up to a considerable height and the cultivators take out fresh lands and so the process goes on. His Excellency the Viceroy himself has suggested that between the lines of fodder trees it would be a good idea to sow a good species of fodder grass and we hope to try out that experiment with grasses of selected species. These plantations, in addition to producing fodder, have another advantage which is shared by no other alternative. They also produce fuel which will be available for replacing cow dung as manure, at least to some extent and therefore making more manure available for the remaining cultivation.

I would summarise the four suggestions that I have made so that the Conference can have definite points to discuss. If you, Sir, and the Conference approve, these suggestions might be incorporated in the final resolution.

(1) Forest areas. The initiation and control of further measures of improvement should be left to the Forest Department to whom the Fodder and Grazing Committees in each province would make recommendations and help with advice. It must be recognised that no improvement of grazing is possible without the voluntary co-operation of the people.

(2) Other waste lands. Improvement is only possible where grazing can be controlled. Government activities should be limited to demonstration and advice and, for a start, in selected areas. But Fodder and Grazing Committee should explore all possibilities of successful control by other agencies.

(3) Surplus cultivated lands. The Fodder and Grazing Committees should also explore the possibilities of growing fodder plantations as well as fodder crops by the agency of zamindars or otherwise.

(4) Finance. Funds will be required for these works of the Forest Department. They should not however be imposed as a further burden on the ordinary commercial budget of the Department but could perhaps be made available under a special head of the budget.

Finally, Sir, may I close with an appeal. As this item no. 2 of the agenda is at present very largely a matter of further investigation and research, as His Excellency the Viceroy stated in his opening speech, might I suggest that it deserves the special and sympathetic consideration of the Imperial Council of Agricultural Research for the next few years as I believe that on this depends to an appreciable extent the possibility of

definite action being taken for the improvement of grass lands and the better utilisation of waste and surplus lands for fodder production in all provinces.

The Hon'ble Nawab Khwaja Habibullah Bahadur : On a point of information. May I know if there is going to be one resolution on both the items, items 1 and 2 ? If this is a constituted meeting, may I know what has happened to item no. 1 ?

Chairman : It is, Nawab Sahib, a very much constituted meeting ; it is not a rabble meeting. The idea is that after all these four items have been discussed, resolutions will be drafted and they will be circulated to the members of the Conference. I think your fears are quite unjustified.

The subject is now open to discussion. I am afraid I shall have to apologise to the Conference that I shall be absent for a short time as I have to attend a meeting of the Executive Council. In my absence Mr. Hydari will take the Chair. The subject is now under discussion.

Dr W. Burns : Sir, In dealing with grass lands, there are two factors to be considered. The first is whether there is any soil at all which will produce some kind of grass and the next point is whether there is any grass land at all which can be altered by altering the environment. If one can alter the environment, then one can change both the quantity and the quality of the grass. The environment may roughly be classified into three big sections, namely, the climate, the soil and the grazing animals. Climate we cannot alter, but the climate does determine the kind of grass land which we are going to have. In each part of India we have six months of dry season and the grass land is of a type which has got to remain practically dry for that part of the year. Now, that means that it is not a typical pasture land as it is understood in other countries. On the other hand, it does produce grazing for six months in the year and parts of it produce an enormous temporary excess of grass particularly if the rainfall is good. This brings in another point which has not yet been mentioned and that is that along with any agricultural programme you do need to have some programme of consideration of the surplus grass. It may be interesting to note that fifty years ago Duthie in his *Fodder Grasses of Northern India* recommended the use of silage, and although we have done a good deal, there is still a tremendous amount of propaganda to be carried on before this becomes a general part of any grass programme. With regard to the soil, that again can only be affected very slightly. In most cases it is not worth while doing much more than very simple bunding. But the soil can be affected and is affected most by the third factor, viz., the grazing animal ; and if one watches the villages hard going out to graze in the early part of the monsoon, one sees very easily what happens. The grass has just begun to grow ; there is nothing more than a faint flush of grass ; the ground is soft, and the herd wanders widely. You get the ground trampled upon and pounded. The young grass is pulled out by the root. Only the palatable grasses are eaten and the unpalatable ones left, and in the last stage, no grasses whatever are left. Then, what is of the most extraordinary importance, the soil is swept away ; in other words, there is erosion and that is a factor to which attention has been given in certain parts of India but not nearly enough : and any grass land programme has got to take into

account that not only is a good grass land programme going to produce more food for cattle, it is also going to prevent erosion and flooding, it is going to raise the water level in the wells and generally speaking it is going to be a great national improvement apart from the effect on cattle. As the aims of our programme, there ought to be more and better grass, the gaps have got to be filled up, and the yield has got to be increased. Then, the species have got to be palatable and they have got to recover quickly from grazing. All these changes can be effected. The experiments of which I have most close experience have been carried out in the parts of the Bombay Deccan with about a 20 inch rainfall. Most of these experiments have been carried out in collaboration with and in land under the control of the Forest Department in scrub jungle because it was only in that kind of place that we could get adequate control. One experiment was carried out for seven years in very poor land lying between villages. It was not waste in the ordinary sense. It was a piece of ground belonging to an individual but it was so little worth his while looking after it that it was just part of an enormous expanse of poor grassland. On that very poor soil we were able in seven years to improve the yield of good grass from 300 lbs. to about 2,000 lbs. per acre. In an area which was one of the forest areas, the improvement was from 1,000 lbs. to about 4,000 lbs. As regards grazing, whereas in the beginning it required 40 acres to feed 20 cattle, in the end it required 24 acres after five years to feed these 20 cattle. In both these cases there was nothing except control of the grazing animals and a very small amount of stopping of the run off of water. In both cases not only was there this increase but there was also an improvement in the species, and the better grasses that were more palatable and nutritious replaced to a large extent those that were less palatable and less nutritious. The better the soil, and the better the rain-fall, the quicker is the improvement. Any committee starting a programme should not tackle as its first effort the very worst grazing lands in its neighbourhood. In their case there is bound to be a long, long time before there is a recovery ; on the other hand, grass lands that are not so far gone recover very quickly indeed, and it is well to start with a success. Mr. Smythies has mentioned and the figures have also shown that it is not mainly a forest problem. The forest people are in the fortunate position of being able to do a great deal more directly than those who have charge of or are connected with lands outside the forest and to that extent forest co-operation is invaluable. At the same time in areas outside the forest also this kind of thing can be done and that voluntary co-operation that Mr. Smythies has mentioned is possible. There was one striking case in a village near Nasik where for over 30 years people have set aside a portion of about 100 acres for grass-cutting. One can see that plot from miles afar on account of the golden yellow of the grass that it carries. Now that is a case where some village genius started this system many years ago, with the result that there is no lack of grass there although the surrounding land is as unpromising as any. That shows what can be done. It is amazing the amount of knowledge that we already have in India with regard to the improvement of grazing lands. Starting with Duthie fifty years ago there has been a continuous succession of people working on this from all points of view. There is a great deal of work being done by botanists here and there in Madras, the C. P., Bombay, the Punjab

and so on. We have now in addition an enormous amount of information available from America, Africa and chiefly enshrined in the abstracts produced by the Imperial Bureau of Plant Genetics (Herbage Plants) and you have got a great deal of practical experience from grass farms, from the military dairy farms and from all sorts of experimentation. Now it is a great pity that that work should continue to be spasmodic and that that information should continue to be scattered, and I think there is no doubt that fodder-committees constituted in the proposed ways should help greatly to bring together that information and to substitute some kind of planning and co-operation for the present very scattered efforts. If it does only that, I think it will have done a very great deal and for that reason I think these fodder and grazing committees are essential and I think this Conference will unanimously propose that we should make certain that a recommendation to that effect goes out.

The Hon'ble Sir S. T. Kampli : What is meant by surplus land which we find mentioned in the agenda ?

Mr. E. A. Smythies : I understood that to mean land surplus from cultivation, from land fit for cultivation or under cultivation.

The Hon'ble Sir S. T. Kampli : That is, surplus land available for fodder cultivation ?

Sir Bryce Burt : Land at present not under profitable occupation.

The Hon'ble Sir S. T. Kampli : Waste land ?

Sir Bryce Burt : Not necessarily waste land.

Khan Bahadur Nawab Chaudhri Mohammad Din : Dr. Burns has made suggestions which, if carried out, will go a long way to effect an improvement in our pasture lands. In Jodhpur State the area under grass farms at present is 15,000 acres and we are taking steps to allot 7,000 acres more. The services of a Marwari graduate of the Wye College, London, have been secured as an assistant under our Director of Animal Husbandry and a systematic investigation of the possibilities of the huge waste areas in the State as producers of fodder is being undertaken. There is a proposal to set up a fodder and grazing Committee in the State comprising the Directors of Animal Husbandry, the State Forest Officer and the Hawala Superintendent (the Chief Revenue Officer). The statistics of *usar* experiment given in the appendices to this note are instructive and indicate the vast possibilities of the better utilisation of waste lands and improving fodder supplies of the country. However, in parts of the country where the average rainfall is very low, we find no grass at all in waste areas. In the Chenab colony in the Punjab 25 per cent. of the area allotted in each Abadkari village was reserved as *chiragh* (grazing land) and in other Punjab colonies also a certain portion is earmarked for that purpose and although the land is rich in quality, no grass grows. I hope my friend the Honourable Chaudhri Sir Chhotu Ram will be able to devise means to improve those *chiraghs* for the benefit of the country.

The Hon'ble Mir Bande Ali Khan Talpur : The question of grazing problems in Sind was thoroughly examined by the Cattle Supply and Improvement Committee presided over by Mr. H. Dow, former

Revenue Officer, Lloyd Barrage and Canals System and now Secretary to the Government of India. This Committee met in the year 1928 and considered the grazing facilities in forest and waste areas of Sind.

Grazing in Forest Areas.—This Committee found that the total area of Sind forests was about $7\frac{1}{2}$ lakhs of acres and the total revenue derived from grazing in these forests was about Rs. 40,000 or about 10 pies per acre. The forests are mostly massed in the riverain areas and there are few inland forests of any great value for grazing. Even in riverain forests most of the cattle grazed belonged to professional graziers and only a small portion of the cattle belonging to cultivators living near the forest are grazed in the forest. The present grazing available in the forest is more than ample for the cattle that take advantage of it, the acreage available per head being 19 acres and the grazing being of excellent quality. The present charge for grazing in forest is 6 annas per head of horned cattle per year, while the professional graziers or maldars took full advantage of these grazing facilities. The Committee further found that the paucity and poverty of inland forests in Sind was a great drawback and something should be done to supplement grazing in areas remote from the riverain forests. They recommended wide belts of babul trees to be maintained along the banks of canals and distributories and small reserves (of from 150 to 250 acres) in convenient centres to be maintained for the growth of trees and grazing by the P. W. D. No action has been taken but the matter will soon be taken up for further examination under the present conditions.

Before leaving the subject of grazing in forest areas, it may be mentioned that Government have given concessions in the matter of levying very light assessment to encourage establishment of private woods (or huris) on zamindari lands which provide valuable fodder in the form of leaves and pods and also grazing ground. For the first ten years light grass rate is charged and in order that this concession may not be abused it was suggested that only five acres of these private woods or huris should be allowed to every 100 acres of holding. Private owners, however, have not taken much advantage of these concessions made by Government.

In view of perennial and assured supply of water on the Lloyd Barrage canals, most of the unoccupied culturable land has been and is being taken up for growing cash crops in the Barrage areas leaving little surplus land for grazing of cattle as in the pre-Barrage days. But in the non-Barrage tract served by inundation canals, there are large areas of unoccupied waste land available for local maldars and zamindars. The Government of Sind propose undertaking an investigation as regards area actually available and water supply of such tracts in order to encourage raising of fodder crops by a system of dry farming known as Bosi cultivation and also the possibility of establishing 'babul' huris in such areas as the latter provide valuable fodder for cattle.

In the hilly areas in the vicinity of Karachi, natural grass production depends on the amount of rainfall—the last few years have been marked by the deficiency of rain and consequently reduction in the supplies of natural grass for the cattle. Government propose to examine

the character of the vast plains lying in these tracts as regards their contour levels and the types of natural grasses grown with a view to introduce a system of "Bund Barani" cultivation which involves bunding and terracing with a view to store rain water into the soil as much as possible instead of allowing it to run waste and also to introduce a system of artificial seeding of the best types of natural grasses, if found practicable. At the same time it is desirable to examine the underground water supply in these areas and to find out if springs of sweet water useful for cultivation of fodder crops exist in the vicinity of Karachi city.

• Dr. R. MacLagan Gorrie (Punjab) : Sir, Dr. Burns has already introduced a subject which is very near to my heart, namely, the enormous destruction that at present is going on practically all over the country, through the neglect of land as a whole. The conservation of the soil is obviously the basis on which the whole of the agriculture of the country is built up, and the subject we are dealing with at present, namely, fodder production, stands or falls by the conservation of the soil. At present the soil is not being conserved ; it is being grossly neglected over practically the whole of India. The amount of destruction is more visible and more obvious in the foothills districts and the more steeply sloping land. But the amount of serious loss of soil even on the more level lands has not yet been realised. Therefore, although the remarks I wish to make apply directly to the steeper lands and the foothills, they do apply also to a very great extent to all the more level lands.

(At this stage the Honourable Kunwar Sir Jagdish Prasad resumed the Chair.)

The amount of farm land which at present is being destroyed through neglect is very alarming indeed. To quote one instance alone, in the Jhelum district of the Punjab during the last 36 years that district alone has been losing $2\frac{1}{2}$ square miles per annum of cultivable and cultivated land through torrent action. It is a very serious figure indeed. How is that destruction taking place ? To get to the bottom of this we have to go to the top of each catchment area. The water accumulates in these streams from the higher grounds, from the foothills which are very largely uncultivable. How do the floods arise ? They arise very largely through the fact that nature has been absolutely flouted in her efforts to keep these steeper lands under some sort of plant cover. By destroying that plant cover through persistent and much too heavy grazing, the land is left exposed and every storm simply sweeps it down into the rivers below. To quote actual figures, figures have recently been published in "Current Science" and in the "Indian Forester" from actual measurements of run-off which have been collected largely by the irrigation branch and partly by the forest service. There is a long low range of foothills opposite the Jhelum called the Pabbi,—an inconspicuous range of hills hardly 600 feet above the river. But the behaviour of the individual torrents which rush off from the steep ground has been correlated absolutely exactly with the amount of grazing which has been going on. There are roughly four classes of land within this range. There is a comparatively small area in which we have been doing counter-erosion and afforestation and the building of bunds and what the

Americans call gully-plugging, over a long series of years. The run-off from that particular area is only 100 cubic feet per second per square mile. The next best type of ground is that which is under a passive protection of grazing. It is a nominal closure. It is not quite complete ; it is more or less closed to grazing but open to grass cutting. The run-off from this is 600 as compared with 100 cubic feet per second. The third class is ground which has been very badly overgrazed. Nominally it is under the protection of the Forest Department. The run-off from this ground is 1,000 cubic feet per second. The fourth and most seriously type damaged, although the topography is absolutely identical, is ground which unfortunately was left out of the original forest settlement, and for the last 50 years has been very heavily grazed by buffaloes, etc. And the run-off from that is 1,600. So you have four figures,—100, 600, 1,000 and 1,600. I do not think you could have wished for anything more convincing to show the tremendous danger which over-grazing is bringing about, particularly in connection with the damage which is done very much further down the streams and to the layman cannot immediately be correlated with the damage in the foothills. The figure of $2\frac{1}{2}$ square miles of destruction in Jhelum can be shown as the direct result of gross neglect of the catchment areas such as I have described for the Pabbi hills. What are we going to do about it ? We have vast areas of this type of country, in Punjab partly under forest protection. It just happens that we have a few boundary pillars round ground which accidentally has been classified as reserve. Originally it had forests on it and that explains the presence of the pillars. But the present condition of the ground is almost equally bad, whether it is inside or outside these pillars. The answer is of course that the grazing has been uncontrolled, and through uncontrolled grazing the Forest Department has been left absolutely helpless and ineffective, and has failed entirely for that reason to conserve the land for which it is responsible. This does not by any means apply to all forest areas but in the Punjab at least there are very large areas to which this remark applies. The Forest Department cannot I think be held morally responsible for the amount of destruction because we were handicapped from the beginning by the forest settlements to which Mr. Smythies has already referred. The cure which Mr. Smythies has outlined is primarily legislation. I think all of us who have any practical experience of the problem realise that legislation is badly needed. But, Sir, at the moment I do not think we can expect the provincial Governments to face up to this fact. Gradually I hope the voice of the people will in time make itself felt and that the legislation will come about in a normal and quiet and slow manner without causing any revolution or disturbance. At the moment if repressive legislation of that sort were put through, there is no doubt that disturbance would occur. Under the circumstances we cannot expect the provincial Governments to undertake that. What is the alternative ? The alternative is to put on a sufficient number of knowledgeable officers with a sufficient amount of drive and organising capacity to help the villagers to organise themselves in this direction. As an example of what can be done we have three areas in the Punjab in which Deputy Conservators of Forests have actually been detailed to carry out such work. In Hoshiarpur the officer there has been instrumental in obtaining voluntary closures and rotational closures to the extent of 70,000 acres in two years.

It is a very large tract of country to be suddenly changed from bare and eroding and rotting hillsides to turn into good grass, which grows very quickly indeed, purely through protection and closure as Dr. Burns has pointed out. Similar work has been taken up more recently in the Jhelum district by another officer, and the results he has obtained there may in a few months' time be even more surprising than in Hoshiarpur. But these are only two isolated instances. What is needed is a similar type of officer, not necessarily a forest officer, but someone with technical training in soil conservation and flood control and fodder production which is obviously the outcome of such control. We need these officers all over the place. We need one for each district almost throughout the Punjab depending upon local conditions. These officers so far have been working entirely independently, but we hope as a result of this conference to get the local sub-committee actively working, and the obvious line of control will be that the officers working in each district will work with the sub-committee. One question which has already arisen in my own experience is the difficulty of getting funds for such work. The Forest Department provincially is not directly represented on the I. C. A. R. and therefore it is not able to put forward its own proposals for a conservation project. That has been the position as far as my personal work is concerned, but there are obviously several methods of approach. One possible line of approach is through the local standing sub-committee as soon as it is formed as it, I presume, will have direct access to the I. C. A. R. to present any proposals for which they think central funds might be justified.

In closing, Sir, I should like to emphasise that whatever soil erosion control and soil conservation work can be undertaken, in many cases the villagers themselves have a very good practical working knowledge of what should be done, and in many parts of the country you find isolated instances showing what has already been done by individuals. The knowledge is there ; what is needed really is some organized driving force to get the village communities to take up this work voluntarily.

The Hon'ble Sir S. T. Kambli (Bombay) : Sir, I am in perfect agreement with what Dr. Burns said as regards the steps to be taken to improve the quality and quantity of grass in India, but there is another side of the question which has not so far been touched in the discussion, and that relates to the question of grazing fees. In the Notes supplied to us on this subject, the question of grazing fees has found a very prominent place. It has been observed in the Notes that the fees for grazing are simply a token amount bearing no relation to the economic value of grazing, and it has further been observed that the low fees charged encourage the survival of a large number of uneconomical animals. With regard to the question of grazing fees, I have to bring to the notice of this conference that there is a widespread discontent in the Bombay Presidency as to the rates charged by way of grazing fees in that presidency. In Bombay we recover an amount to the tune of 5 lakhs per year by way of grazing fees, as compared with Rs. 20,000 in Bengal, Rs. 18,000 in Burma and about Rs. 1½ lakhs in U. P. The only province in which a similar amount approaching the amount levied in Bombay is charged is Madras, and I find from the figures I have been able to collect that the Madras Government levy an amount in the neigh-

bourhood of 6 lakhs per year. Sir, I am not at all convinced that the fees for grazing are simply a token amount as observed in the Notes. We have to consider the capacity of the agriculturists to pay the same. In the first place, we find that in Bombay there are a large number of villages which have contributed for the making of forests, and in such villages even a small amount of fees presses very heavily on the agriculturists themselves. Therefore, what I do submit is that the question of grazing fees should be left to the provinces concerned. As I said, in my presidency, there is a widespread discontent as to the grazing fees that are levied there, and the Bombay Ministry has published a programme in which they have made it clear that they have decided to give a remission in grazing fees in the Presidency. What I do propose is this, that the question of grazing fees should be left to the province themselves, because the conditions in different provinces differ very materially, and while it may be true that in the case of some provinces the amount of grazing fees can be treated as merely a token amount, in other provinces that amount presses very heavily on the agriculturists. Therefore, Sir, I do wish to bring to the notice of this conference that this question of grazing fees should be left entirely to the provinces themselves.

The Hon'ble Raja Maheshwar Dyal Seth (U. P.) : Sir, in his admirable speech Mr. Smythies, pointed out that the chief source of supply of food for cattle everywhere must be the grazing land under forests, and other waste lands and surplus land or agricultural land on which fodder can be grown. The land under forests serves only a very small fraction of the population. In the U. P. where the area under Forests is a little over 6,000 sq. miles, the area actually available for grazing is just a little below 3,000 sq. miles. I feel certain that legislation will be necessary to overrule the present forest laws which have deprived the cultivators and their cattle of a large area of grazing ground which should have been available to them. That is a very big problem no doubt and it is fraught with great administrative difficulties, but there is no reason why it should not be tackled satisfactorily. More important than the question of improving the grazing land in forests is the question of other waste lands. The total area in our province for waste lands is 23,000 sq. miles as against 8,000 sq. miles of the forest, all of which cannot be made available for grazing, but a good deal of that can certainly be made available for grazing. 8,000 sq. miles of this is Usar land and the experiments recently carried out in some of these Usar lands have shown that merely by closing the area for grazing during the rainy seasons the yield of hay has increased from 2.75 maunds to 15 mds. per acre, and we want improvement for production of more hay on the waste land. These waste lands which are available for growing hay and the area under forest which is available for grazing do not solve the problem, and we must have a much larger area for grazing before we can solve this problem to any appreciable extent. I will come to that a little later. But I feel certain that the chief means of sustenance for our cattle must be the surplus agricultural land and fodder. That alone can solve the problem to an appreciable extent. What is needed, I think, is some legislation to reserve an area in order to make it common pasture land. This of course will increase the burden on the land which is already very high, and when our cultivators cannot grow enough food for themselves, it is rather difficult to expect them to leave a good deal of that area for the growing of fodder for their cattle, but what I feel is,

improvement in the general condition of the masses must precede any improvement in the general condition of the cattle. When the masses themselves are half-starved, it is no wonder that their cattle are deteriorating and are bound to further deteriorate ; when they cannot find enough food for themselves and for their children, it is idle to expect them to feed their cattle better. Therefore, we certainly want more common pasture land in every village on a compulsory basis, rather legislation should be adopted to bring under control more common pasture land, and then when we have less land available for agriculture, the bringing into cultivation of high yielding varieties of crops and the adoption of better standards of cultivation will enable the existing production to remain almost the same as it is in a larger area. It has been suggested by one or two speakers that we should not do anything by compulsion, and the best way is to carry on propaganda and adopt persuasive methods. One of the speakers just said that the voice of the people must in itself be felt before any change can be made. I am sorry I cannot subscribe to this view. I think if you follow the methods of propaganda and persuasion, we shall have to wait not for a few generations but for a few centuries before we can find any appreciable improvement in the present conditions. When once you are convinced of the soundness of your scheme and when you feel that it is for the good of the masses, why not go forward with it boldly ? And I feel that if we want to bring about any appreciable improvement, we shall require a Mussolini or a Hitler in India. I am perfectly certain that we shall want legislation to have common pasture lands for the villagers, and to give better rotation of crops means production of more food for the people and more leguminous fodders of a better variety. How that is possible, what better planning of rotation is possible it is for my Director of Agriculture to say, as I am not competent to express any view on it, but I think we must have legislation to have common pasture lands before we can have any appreciable improvement in the methods of providing more food for our cattle.

Mr. Z. R. Kothawalla : I entirely agree with the observations made by Dr. Burns. My feelings all along have been that we have been concentrating too much attention on merely the production of fodder. The production of fodder is no doubt important, but its proper conservation is equally important. We all know that in order to rear good stock there should be an assured supply of fodder throughout the year. One of the methods adopted all over the world to ensure this is to turn into silage any surplus grass. Silage making is not a new thing in this country. In fact, it has been adopted as a regular practice on most of the up-to-date farms. We have also found that silage making is one of the cheapest forms of conserving fodders in this country, and the method is so simple that I think it can be adopted even under village conditions. I am referring to the pit method of silage making. Unfortunately this method is very little known outside of the Government farms. I would therefore strongly suggest that silage making should be introduced more intensively into the villages and into areas which are to be reserved for fodder production as one of the measures for ensuring supply of fodder throughout the year.

Mr. W. S. Read : I think it may be of interest to the Conference if I make a few remarks on what has been happening on one of the largest controlled grazing areas in India. As most of you know, I come from the

Government Cattle Farm at Hissar. It has about 40,000 acres of which 4,000 acres is under irrigation and the remainder is entirely grazing land. The peoples' cattle are kept out and we are therefore able entirely to control the grazing. We move herds of cattle from pasture to pasture at different seasons of the year. I have been there for nearly 18 years and my personal observations are that the grazing area is deteriorating. The Hissar Farm is part of a vast level plain according to the Gazeteer. That term is no doubt relative, it is an undulating country, and although the general public do not realise that erosion goes on, it does go on. When I went to Hissar in 1919, then and in the following years we were getting good grazing and making large quantities of hay and silage every year. Some of those areas have been practically producing nothing now. I went into the matter a year ago with the help of Mr. Mackenzie in the Punjab and we got a scheme for the improvement of our grazing and the best way is by bunding the land, a simple and cheap method. I forgot to mention that the annual rainfall is only about 14 inches of rain, and most of it falls at one time of the year. The soil is very dry and rain falls 3 or 4 or 5 inches at a time. The water goes down the depressions and it produces a kind of coarse grass which is practically useless and worse still, it forms a breeding ground for waterborne diseases for cattle. We decided that if bunds were put up, this would be obviated and a scheme was put up to the Government and I hope I am getting my first instalment of money to start the work in Hissar. This is a simple thing which could be done in other places. There is no need for going in for expensive schemes, but simply put up more bunds to stop the rain running down the depressions. I think this could be easily done in many parts of the country and the improvement in grazing would be great.

Chairman : Has the Nawab Sahib of Dacca anything to say ?

The Hon'ble Nawab Khwaja Habibullah Bahadur : I have nothing to say on this.

Chairman : Sir Anand Sarup.

Sir Anand Sarup : I have nothing to say.

Rai Sahib K. I. Thadani : I wish to bring to the notice of this Conference a certain peculiar condition in relation to the production of fodder which has come about in the barrage area of Sind. As you know, under improved conditions of water supply we expected to grow 27 per cent. of our holding under kharif crops and 54 per cent. under rabi crops. Under kharif crops our original project contemplated that 18 per cent. would grow a cash crop like cotton, and 8 to 9 per cent. would be under cereals and fodder crops. Cereals also provide straw for cattle. What has happened at present ? Cotton cultivation has gone on increasing so much so that almost the whole of the 27 per cent. is being grown with cotton leaving nothing for cereals to be grown there. The agricultural department and other authorities have been trying to use all their personal influence to do propaganda among the people to try and ask them to grow at least 5 to 6 per cent. under jowar bajri, but the result of their efforts has been that they have not been able to change the condition I have described. Similarly, take the rabi crops. We complain of fodder. We are not growing actually 54 per cent. of the area under rabi crops, although we have water supply. Wheat of course is increasing and the whole rabi cultivation is between 30 and 35 per cent. We have water

supply and yet people would not grow fodder crops. Wheat has no doubt answered this problem by the use of its straw and the cultivation of wheat has increased from 3 to 11 lakhs of acres. This matter was considered by the Provincial Board of Agriculture and two very important resolutions were passed unanimously and I would like to bring those resolutions to the notice of this Conference. They are :—

- (1) The Board recommends that Government should undertake an examination of the present position and trend of the cultivation of fodder crops in Sind and consider whether any reduction in the assessment of different types of the main fodder crops grown in the province, in either the kharif or rabi season, is necessary to guard against any definite fodder scarcity in the future. In addition, all other methods of encouraging the cultivation of fodder crops and of persuading or compelling zemindars to increase the areas available to their haris for fodder production, should be investigated.
- (2) The Board recommends that, with the object of popularising the cultivation of leguminous crops which serve as cattle fodder and, at the same time, help to maintain the fertility of the soil, Government through the Agricultural Department should buy, store at suitable centres in the districts and sell at cost price (over a period of three years in the first instance), a stock of seed of berseem and guar in small lot to zemindars who are not accustomed to these crops.

Actually some action has been taken in that direction and finally a report will be submitted. In the same matter it has been brought out whether the increased yield of certain staple crops due to the use of new high yielding varieties should permit land to be released for increased fodder cultivation. I may mention that this is not quite so hopeful owing to the land tenure system where the land belongs to the zemindar and the farmer is an annual tenant sharing the produce with the zemindar. The owner of the land is not interested in the cultivation of fodder crops which do not bring him as good return as the money crops. Unless there is a legislation fixing the proportion of fodder crops to cash crops, any act of persuasion and propaganda is not likely to meet with great success. At the same time, public opinion is not in favour of such legislation.

Mr. T. A. Whitehead : Mr. Smythies and Mr. Burns have put the matter very clearly and I am in entire agreement not only with them but also with the other experts who have spoken on the subject. But as the time is very limited I shall be brief. In the Madras Presidency the problem of the control of grazing in reserved forests is a very much more simple matter than that in the U. P. as detailed by Mr. Smythies. In the Madras Presidency there are certain rights over small areas, but taking the matter as a whole, we are not encumbered by them to any great extent and this can be put right in the Madras Presidency by an executive order by the Madras Government. Prior to 1924 our Reserved Forests were divided into small grazing blocks and we issued permits to graze in the blocks and we were able to regulate and limit the grazing. After 1924, owing to agitation in the Legislative Council those permits which were valid for

one block were extended to a whole range which amounted approximately to 100 square miles or 64,000 acres. Later, owing to further agitation, this was still further extended to a whole district which may represent roughly 700 square miles or half a million acres. It is quite obvious in these circumstances that it is impossible to control grazing and this robs us entirely of any hope of control over grazing in the reserved forests. At present any one can apply for grazing permits for any number of cattle and graze his cattle wherever he likes within the district. There is no hope of improving the grazing lands in these circumstances. What I have said applies to the 16,000 square miles of reserved forests under departmental control. We have also in the Madras Presidency 3,000 square miles under panchayat management which is controlled by the revenue department. In order to make the best of our resources it is necessary to make adequate provision for water, to divide the forests into convenient grazing blocks and to introduce rotational grazing, necessitating periods of closure as well as the limitation of the number of cattle. The need for these measures has been considered, recognised and acknowledged by the Madras Government, and as requested by the Government of India, the Hon'ble Minister for Development to the Madras Government is prepared to state now before this Conference what the result of their consideration has been in regard to these points.

The Hon'ble Rao Bahadur M. C. Rajah : Mr. Whitehead has now given to the Conference a short history of the system of grazing in the Madras Presidency and has also explained the system now obtaining there. I need therefore only confine my remarks to the specific recommendations of the Madras Conference. I gather that the Conference, or, at any rate, the Government of India desired to know what decision the provincial Governments have come to on these recommendations. I may say that the Madras Government have accepted all the four recommendations in Part I of the Committee's Report. We expect that there would be an outcry against the restrictions proposed in recommendation (3) in regard to limitation in the number of cattle utilising the grazing and in the period of utilisation in so far as forests under departmental control are concerned. Such restrictions are already in force in reserve forests which are under panchayat management and known in Madras as "ryots' forests" and we hope that the ryots will in course of time realise that it is to their good that these restrictions are extended to the forests under departmental control also. Provided therefore the Legislative Assembly approve the change in policy involved in recommendation (3) and vote the funds required for carrying out improvements in the forests, we are prepared to implement these recommendations.

There is not the same amount of difficulty in regard to reserved forests under the ryots management. In this case the ryots themselves are under an obligation to effect improvements. There was a Government staff whose duty it was to go about inspecting these forests and indicating what improvements they were to carry out and how it was to be done. Unfortunately, owing to need for retrenchment, we were obliged to abolish the staff. But now it is our intention to revive these appointments or at least 50 per cent. of them even from this year if funds would permit. With these posts revived, the Madras Government hope that it would be possible to effect improvements in these forests both in respect of water facilities and the quality and the quantity of the grass provided in them.

As regards waste land, we are not very hopeful of finding land suitable for grazing on any scale worth mentioning but propose to have an investigation made into the matter. Wherever we find suitable blocks we intend notifying them as reserved land and handing them over either to the Forest Department or the panchayat for efficient management.

We also agree to the appointment of a Standing Fodder and Grazing Committee for the province and this committee, I need hardly say, would welcome advice from the Grazing Sub-Committee of the Imperial Council of Agricultural Research.

Mr. F. Ware : As a result of informal discussions and also from the discussions that have taken place this morning, I have gathered that some provinces and States consider that this subject really does not affect them very much. I think that is because the actual forest grazing available in those provinces is comparatively small. I think it might interest the whole conference if I gave them some figures showing what our fodder resources are in this country, and what an enormous problem it is to try and feed our animals. These figures show that in the matter of straw and what is usually called roughage we have an amount which varies from about 2.6 pounds in the United Provinces to 4.9 pounds in Bombay per head of bovine population per day. In addition to that if we take all the areas which are set aside for the growth of special fodder crops we have an extra half a pound of green fodder available and in addition to those two items we have, if we exclude Assam, which is particularly fortunate in the matter of grazing, about half an acre of grazing land available. If we consider that these figures exclude any reference to other animals except cattle, if we remember that only a percentage of these animals can get concentrate and if we try to visualize what that half an acre of grazing land is like at the present time for at least half the year, it will give us some idea, I think, as to why our cattle in this country are so degenerate and what an enormous amount of work we have got to do in order to fill up that hiatus. I suppose these provinces which are at the present moment not particularly interested in this question of grazing are taking as their sheet anchor the increased production of fodder crops. Of course that is a very important subject and we are going to discuss it later but at the same time I think it must be obvious from the figures produced that it is necessary for every province and State to make as much use as possible of all the available land which could be used for grazing and as you have heard it amounts to something like 45 per cent. of the total area in British India. In regard to this 45 per cent. of land there is of course a certain amount of difficulty in understanding exactly what is meant by it but no doubt this Standing Fodder and Grazing Committee will take up the question of reclassification and we have just heard from the Honourable Minister from Madras that he has not much hope of improving these lands but on the other hand we heard from some forest officers how much can be done by the simple method of bunding. In any case it is most important, I think for us to try and face the position as it actually is in this country and in that connection I would refer to two points. The first point is that grazing facilities for our young stock are essential in any case, but more particularly if we want to produce good bullocks they must have grazing land and exercise land and there is no reason why our exercise land should

not be made grazing land, and the second point is that even in those provinces which do not appear to be interested in the question of grazing at present there must be large areas of land where the question of growing fodder crops for cattle is very difficult at present and is likely to remain so for a good many years. As I visualize the position, it is this. Where cultivated lands are concerned, our livestock have got a competitor in the shape of the human being and the ryot has got to decide if it is going to pay him better to grow fodder crops for his animals or crops to feed the human population. He has got to decide whether he can afford to set aside any land for growing fodder crops for his animals. On the other hand, in regard to grazing areas our livestock have no competitor. That is a very important point for us to remember. This 45 per cent. of the total area amounts to something enormous and if we can improve the grazing of that large area, even by a very small amount—I am not going into the details—it will provide us with an enormous increase in our fodder for our livestock.

Mr. C. F. Bell : I can speak with some knowledge of this subject, as I was one of the pioneers of grazing settlements which were started in Government forests of the Central Provinces about 25 years ago. I have also dealt with many of the more recent settlements which have passed through my hands as Conservator and Chief Conservator. The C. P. Government forests are free of all rights of user and even so the imposition of restrictions of grazing incidence and periodic closures to grazing have met with considerable opposition and have been very difficult to introduce. It will be useless to attempt such settlements in Government forests elsewhere unless the Forest Department has full control, and this will often mean revision of the forest settlements in the first place.

The waste lands in the Central Provinces, utilizable as grazing grounds, cover approximately 25,000 square miles and are, for the most part, privately owned. Legislation will, therefore, be necessary before any steps can be taken to improve the quality of the grazing by periodic closures.

It is quite true that this question bristles with difficulties but it is well worth while attempting to introduce some form of control of grazing, both in Government forests and waste lands which respond very rapidly to rational treatment. I have seen the vast improvement which has taken place in the quality of the grazing grounds of the C. P. Government forests as the result of the measures started in 1912 and believe that it will be possible to effect similar improvement in the waste lands. I am encouraged in this belief by the success which has attended the powers vested in the Local Government by the Central Provinces Land Revenue Act to deal with forest growth in waste lands in Malguzari villages. When I first joined the service, the officers of my Department were inclined to scoff at what they considered the quite inadequate control and management of forest growth in these areas and to predict that the malguzari forests would disappear in 30 or 40 years time. Thirty-two years have passed and these forests are still there and not much the worse for wear. In fact, in some districts, they are serious competitors of the Forest Department in the sale of forest produce. And if we have been able to deal with this satisfactorily, I think something might be done as regards the pasture and I support this proposal to have this committee which will co-ordinate

the work done in different centres. It will be probably found useful elsewhere. I have made a deep study of this matter for a good number of years.

Mr. B. K. Badami (Hyderabad) : While discussing this subject, I think the opinion of a farmer who has been looking after farms for the last 15 years may be useful. We have some 'encouraging' results in Hyderabad. We have a grass farm that came as legacy, owing to the evacuation of one of the cantonments. This has been a grass farm for the last 100 years or more. It has never failed us, as far as I know, and the yield during the last 25 years has not lessened either. Perhaps it is due to the simple operations carried on this farm. A little control in grazing is necessary and I feel that once you have some control, the growth of pasture is a very easy affair. I am an amateur farmer who has been carrying on this work. All that we do is

1. We do not allow the scrub jungle to be destroyed.
2. For six months the farm is closed to cattle for grazing and after harvesting our hay the stubble is leased for grazing.
3. The villagers are not allowed to take the droppings of the cattle from the area.
4. Every second year the stubble is burnt just before the monsoon and this has a beneficial effect.

The simple methods which we adopt have been very helpful to us. In the grass areas of the forest department—the district forests, and as we call them famine reserve ravines (grass lands), the yield of hay per acre has been between 800 and 1,000 lbs. or 1,200 lbs., whereas in our farms it has never been less than 2,000 to 2,500 lbs. per acre. The Hyderabad Forest Department has been carrying on experiments in various areas as to how improvement could be made. They are constructing wells and bunding ravines for conservation of water. This work was started a couple of years ago. It was suggested by a speaker here that a certain amount of land in every village should be reserved for grazing purposes. In practice however this does not appear to be a workable proposition, because the demand from people for land for agricultural operations is great. We had similar orders passed in Hyderabad about 20 years ago that in every village, 25 per cent. of the lands should be kept as cattle grazing areas. The demand was so strong that the revenue authorities could not always prevent land being given for agricultural purposes. It is also a good thing, I think, because in those tahsils where such lands have been taken away for agricultural work, I find that the useless cattle one generally sees in villages are lessening and only useful cattle are maintained, such as cows and buffaloes for milk and working bullocks and the ryot knows enough that he should have some fodder for these otherwise he would be nowhere. The villager naturally finds that he should grow such crops as would bring him more money. I wish to tell the conference a recent experience we had in Hyderabad. Last year we had famine in two districts bordering on the Ahmednagar district of the Bombay Presidency—and a suggestion was made and accepted by the Famine Board as of practical politics. There are a large number of wells in the district and Government let the villagers know that all those who would grow fodder for cattle under well irrigation up to the extent of 2 acres

would be exempt from the cess which was about Re. 1 or Rs. 2 per acre. That was said to be a very popular measure and the villagers very much appreciated it. I suggest that such a step should be made a permanent measure, and the revenue authorities should agree to it. It has been found necessary that the forest and the revenue departments should control pasture land. The villagers indiscriminately graze their cattle when there is no control with the result that when famine breaks out, they are helpless. We recently gave fodder for cattle from a Government controlled farm. There is one farm which was able to provide from its reserves eight lakhs of lbs. of baled hay. If we only make up our minds to improve the fodder of pasture lands, and control them, we will not be threatened with fodder famine. We have been adopting measures which Doctor Burns told us how to improve the fodder supply. About 20 years ago, the Pusa Institute very kindly analysed for us some of our best grasses. We have been trying to destroy other grasses by all means available and concerting measures for propagation of the four special types of grasses which have been found to be the best. I think every farmer can adopt these methods and it is an easy matter to improve the pasture with controlled grazing.

Mr. J. S. Garewal : Mr. Smythies in his opening remarks urged the point that these provincial committees could not themselves do the whole work of organizing the improvement both in forest and waste lands. I should like to ask the Conference in framing the Resolution to make it clear that the function of the committee should be mainly executive and not administrative. They may work, they will work through the normal channels, but that if their function is purely administrative, we should get down to the usual routine of the thing being passed on from one office to another and nothing much would be done in the end. As Mr. Ware pointed out one of their chief duties would be land classification and that falls under two parts, firstly make an audit of the present uses of land, in which case, it is merely collecting and correlating the existing information, and secondly regional planning for the future. As Prof. (?) of the Breeding Association pointed out he was suggesting a rough solution and he said that regional planning simply meant application of sciences of botany and economy to the rejuvenation of agriculture. All sciences are based on research work and unfortunately, it is a fact in India that research work into the pasture improvement is somewhat deficient at present. I think the reason for that partly has been that there is an enormous amount of difficulty in deciding on any useful method of recording the relative values of different pastures. That is the only other point I wish to make. I think if the Central Institute could take up this point of producing an approved standard method for recording the quality of pastures, it would be very good and I think that can be done only by a central institute and it would be of enormous use to all the provinces and possibly throughout the world because there is that difficulty at present of having no standard method of recording.

Sir Bryce Burt : Sir, there is no need for me to take up much time in summing up the discussion. I think we have enough material now to put forward this afternoon a Resolution or Resolutions which will convey the general sense of the conference. I only want to make a very brief reference to an appeal made by Mr. Smythies. A reference was also made by

Dr. Gorrie to the part which Imperial Council of Agricultural Research should play in the matter of research. In accepting the recommendation that the Council should set up a central committee, we definitely contemplated that that committee would come before the Council in due course with a proposal for funds for research experiments. I may say myself that if any such proposal comes it will have my own support in the Advisory Board and in the governing body. The conference has it in its own hands, because the governing body mainly consists of Ministers in charge of agriculture in the various provinces and the corresponding Ministers in the contributing States so that I think we may be assured that any recommendation of this conference to Imperial Council of Agricultural Research would be thoroughly well protected. That is all I have to say.

Chairman : We had better now proceed to the third item on the agenda because we have been discussing this for nearly two hours. If we wish to finish the business of the day by this afternoon, it would probably be generally agreed that we should proceed with the next item no. 3.

Mr. C. F. Bell : May I suggest that as fodder production is so closely linked up with grass production, it might be convenient to take up item 4 instead of item 3.

Chairman : All right, we shall take up item no. 4.

Sir Bryce Burt : Sir, we put forward this question of crop planning for increased fodder production in order to get a discussion and start people thinking about it and we hope to start people acting on it. It was one of the criticisms of the Agricultural Department in India during the long period of economic depression and low prices that by introducing high yielding rotations of crops, we were merely adding to the cultivators troubles. That, Sir, found expression in the Press not only in this country but in other countries of the world. Every agricultural department was equally subject to the same criticism. Our reply to that was that we were out to increase the efficiency of agriculture and that if land is not wanted for one crop, it was very badly wanted for another. Now, Sir, the position briefly is this. The ascertained area under important varieties of the principal staple crops is 20 million acres and our growth in that area is very considerable. I have been able to give figures for a few of the more important crops, such as rice and wheat among the cereals, cotton, jute and sugar cane and ground nuts among the commercial crops, because we have only very imperfect information as to the area under many other crops. We do not want to indefinitely increase our production, either under cotton or jute or ground nuts. They are the three principal crops where our present production roughly speaking is adequate. If we are going to take full advantage of these high yielding varieties which are gradually extending in cultivation, we must release some ground for other crops. My suggestion is that part at any rate of that land should be used not in other alternative cash crops, but for the better feeding of the cultivator and for the better feeding of the animals. It means there should be actual rotation of crops. The actual change under the cropping scheme is a matter not merely for provinces. Places to make a start obviously ought to be found in those villages where the agricultural department is well established where it has had success and where people know that what the agricultural department says is true. I would like to mention just two examples of what could be done.

We know that we have a most valuable series of fodder crops in *berseem*, *senji* lucerne, fodder juar and fodder maize and such well known pulses as *methi*. If only a small portion of the area was released by the adoption of high yielding varieties of staple crops, they can be used for growing crops of this nature which might greatly improve the fodder of our animals, not only qualitatively but also quantitatively. We are not limited to this particular form of development, wherever there are new irrigation facilities, as for example tube wells, you have added irrigation facilities and more intense cultivation could be undertaken. There also some area should be put under fodder crops so that the cattle may be better fed and so one may start. If one may so put it, you can increase the efficiency of the cultivator and his animals by the better feeding of cattle. My suggestion to the Conference is that in every agricultural department which has now become permanent and wherever you have intensive cultivation developing and wherever you have a large area under new varieties, some definite consideration should be given to crop planning for the greater production of fodder.

Chairman : Now, the matter is open to discussion.

Mr. W. Sayer : We have done at Pusa a considerable amount of work on this question of fodder crops. In 1935 the work was published in the *Herbage Reviews* No. 3 of 1935 by the speaker. In that we referred to the fact that we had tested nearly all the foreign grasses so largely written about and advertised in their own countries and we had also tested a great many other crops of the leguminous type against our own crops grown at Pusa. Our conclusions which I will now read out are as follows. "All our work on foreign grasses has led to the same result. We find that all these imported grasses do well in the monsoon when we have every fodder grass in abundance. None of them is of any value when we have no grass, i.e., in the hot weather and in the winter. In berseem we have the best irrigated fodder crop in the world". The introduction of berseem in Pusa was in 1917 and we got it first of all from Sind. Before we grew berseem at Pusa, we had to feed the herd and work cattle very largely on 400 acres of highland. We have no irrigation at Pusa. When we got berseem to the area, we took over an area of 120 acres of dhab land, that is to say, the land that is flooded in monsoon and is covered with a thick sand crust. We irrigated that land and on that area of 120 acres we have maintained the herd and all work bullocks with hot weather maize and berseem grown in rotation. We have never manured that land and when we left Pusa last year that land was stronger and better than ever. We have also made a tremendous improvement on silage, and further than that we have made berseem hay which I find to be one of the most valuable feeds of stock that we have in India. When I refer to growing hot weather maize as a rotation to berseem, I may say that maize is a very heavy fodder. We find that the berseem gives all that the animal wants. In the three years rotation you can put oats instead of the berseem. As a matter of fact, just before we left Pusa, I put in sugarcane and got a tremendous crop. So you can quite clearly see what you can do with a crop like berseem on irrigated land. You can rotate it with sugarcane if you work your land properly without any manure, and that is a very big thing to be able to do. A tremendous lot of irrigated land in India is probably not properly manured for the simple reason that I do not

think it is realised to what extent a crop in the rotation like berseem can provide manure as well as fodder for cattle. We have now in Delhi an area of some 40 acres under berseem. I was not at all certain when we put it down as to how it was going to do; but to date, it has given us about double the amount of fodder for cattle that it gave us in Pusa, and I am now able practically to halve my area, although I have a much larger number of working bullocks and I intend to increase the herd.

If we look at the cultivator's problem in the same way as we looked at it in Pusa, you will see one thing. And it is that until you increase the value of these cattle in India, you are not going to get people stopping the growth of cash crops in order to provide fodder for cattle. The trouble is that when you get down to actual facts it comes to this. If an animal is worth about Rs. 15, it is a very hard job to expect a man to put his valuable land under fodder crops when that Rs. 15 worth animal is getting along perfectly well. Now, there are very few countries in the world which feed their cattle better than they do in India. The really good cattle are fed very well. You have only got to see some of the cart bullocks to find out how well they are fed and how well they are treated in spite of their value being so low. Unless, therefore, you get some value put into those scrub cattle either by lessening their number or else by adopting some such method by which it is made more expensive to keep them, (in that case their number will be lessened), you will not get this question of fodder taken up. The moment the cultivator finds that he is going to get a price for them, he will proceed to put his land under fodder cultivation. But until that is done, I do not see any chance of the movement making any headway. I went round to Meerut the other day. Lot of fodder is being grown there under tube wells, but as far as I could discover it was being sent from the villages to Meerut to be sold for the use of polo ponies. It is for that reason that I urge that unless you raise the value of your cattle, you are going to have a great deal of difficulty to put land under fodder, though it can be done, and it is a perfectly good farming proposition as I have already shown it.

Lt.-Col. E. W. C. Noel : The remarks of the last speaker in regard to berseem are particularly applicable to the North-West Frontier Province as we are supplying berseem to the rest of India. We are yearly getting increasing demands for seed. Berseem for fodder will yield 100,000 lbs. per acre, but if two cuttings are sacrificed, 400 lbs. of seed per acre will be obtainable, which is up to the Egyptian standard. The Royal Commission on Agriculture drew attention to the importance of the supply of seed. They wrote: "If the seed of this crop (berseem) can be cheaply grown in quantity, there is at least some ground for the hope that in tracts such as the Punjab and Sind, it may be added greatly to the fertility and wealth of the country". We have been carrying out experiments of making berseem hay. It has been suggested to the Army that they should partially substitute this for Bhoosa. Samples of berseem hay and bhoosa were analysed and as a result a substitution of ratio of 20 to 12 has been suggested. As the Army are now buying bhoosa at 11½ annas a maund we would be justified in asking a rupee a maund for the berseem hay. At that price it would be a profitable crop. The proposal is now under consideration to supply.

1,000 tons of berseem hay next winter to a Cavalry Unit as an experiment. The question of the use of berseem hay for feeding cattle might be taken up in other parts of India. It would seem that the feeding value of berseem hay from an acre is considerably higher than in the case of any other crop. A new variety of berseem from Egypt is being tried this year which gives one single heavy cutting and is therefore useful in cases where the rotation demands the sowing of the next crop in the early spring.

Mr. P. B. Richards : This question of the introduction of more fodderous rotations is one which is receiving considerable attention of the United Provinces Government at the moment. We have to deal with the question from two points of view, namely, in connection with our cattle improvement scheme and in connection with the maintenance of fertility. So far as cattle are concerned, for the ordinary cultivator it is better that he should have some kind of fodder rather than none at all. It is no use our attempting to do anything great in the way of improvement of cattle in general throughout such a country as the United Provinces unless we pay proper attention to the feeding of the young stock in order to get the real intrinsic value. I am in entire agreement with Mr. Sayer and I can tell him that in actual practice in our special cattle breeding districts, where extensive work is going on, the cultivators themselves are readily taking to the introduction of berseem and are growing more fodder because they realise that they get their money back in the increased value of their cattle. Apart from that, with the proper use of the leguminous fodders, we undoubtedly have a very important weapon in soil improvement. We have a cattle breeding farm in Kosi and there we have recently taken to the growing of berseem followed by cotton and the cotton crop which it resulted has been so very much greater than has ever been grown in these areas before and it has paid for the cultivation of berseem quite apart from the value derived from the berseem itself. You can grow berseem with the cotton by sowing it in October. There is no other way, I feel certain, by which we can, without interference with the cash return of the cultivator, ensure a greatly augmented stock of nutritious fodder. Our guiding principle and I think it must be the guiding principle wherever such attempts are made is that this production of fodder must result at least in no loss to the cultivator for the rotation compared with what he has got in his cash improvement crops. His cash returns over a period of years must be at least as great and he must be able to grow his own food. We cannot hope for any thing, unless you can demonstrate to the cultivator, to get him to take it up and I think that is what is to be our main plank. You have to deal with this problem piecemeal to suit the irrigation and soil peculiarities of particular tracts. We may even have to deal separately with different parts of units so small as a village, but that does not create any great difficulty provided we have the staff for demonstration purposes. It is on this that the whole of the rapid advance desired must depend. You must be able to demonstrate on the cultivator's own fields that with the method you propose he is going to be better off in the long run. Now, as to ways and means, there are a number of possibilities which may have been tried out in other provinces but which we have not yet fully exploited. The growing of berseem, with an early *kharif* crop preceding it, which you have heard of in Pusa, has been so highly successful, is one of the methods which we hope will take on in a good deal of our

area. The main difficulty about that is of course the necessity for considerable irrigation water. In the work which we are doing the Irrigation Department is co-operating with us and all our trials are being watched both from the point of view of the utilization of canal supplies and of the final result to the cultivator. So interested in fact is our Irrigation Department in the spread of leguminous fodders that it is considering concession rates even though the amount of water required is very high. I am inclined to think that in irrigated areas a great deal of reliance will have to be placed on double cropping in areas in which single cropping has usually been the practice,—double cropping particularly to take up in rice areas and an early *khari* crop in order to be able to clear the land and get down to leguminous crops for the *rabi*. Similarly, with ground-nut, we can take early ground-nut crops which can be off the land in time for preparation for the *rabi*, in this case generally grain which will augment the *bhoosa*. There is a point which occurred to me when we were discussing the previous subject of grass-land utilization—the information which was given to us of the possibilities of hay in some areas sounded very promising. The U. P. experiment which Mr. Smythies remarked upon has given an increased yield of about 12 maunds per acre at the outset. If the whole of our six million acres of waste land could be developed to produce an extra 10 or 12 maunds of hay, it would mean, for our very heavy cattle population, a matter of two maunds of additional fodder per bovine per annum. It seems to me that areas which can grow good crops of hay must be explored to see whether they cannot grow better crops of cultivating fodder. If land is good enough to grow good hay, it should be good enough to turn out a bigger average of fodder, either *khari*, *jowar* and gram mixed or with a *rabi* fodder crop where no irrigation water is available.

Khan Bahadur Muhammad Ayub Khan : We have heard from previous speakers about the quality of the berseem crop both as a fodder crop and a leguminous crop, but in the case of Sind, in addition to this crop, there are other crops like gram, *mutter* and other crops which are very popular with the cultivator. The fodder crops as well as the leguminous crops have done very well in our province. Usually the cultivator prefers to grow these crops in Sind for two reasons : firstly, on the right bank of river Indus, although there are barrage canals and it is mostly an irrigated area, but the area is usually cultivated with rice crop, and the rice crop is grown from year to year. Therefore, at the time when the *rabi* cultivation is grown, the cultivator in Sind grows gram and *mutter* crops in order to supply fertility to the soil and make it fit for continuous cultivation from year to year with a rice crop. Similarly on the left bank where mainly cotton is grown and about which the Director of Agriculture from Sind has already mentioned something, it has been found to be more desirable to grow berseem, or such crops. These leguminous crops go very well with cotton cultivation. Sir, the complaint in Sind is that the usual tendency now is for the owner of the soil to grow those crops which pay him most, and particularly crops like cotton and sugar-cane. It is quite natural that these crops are preferred by the owners of land, for one reason particularly that when the barrage canals were opened in 1932 and they have been irrigating the lands from year to year, most of the waste belonging to Government was sold out to the highest bidder, and those people who purchased these

lands and also those people who owned their lands and who enjoyed the barrage concessions would certainly prefer to grow such crops as would enable them to pay off the initial cost which they had to incur in buying these lands. So the question is really one of economics there and we cannot blame these people if they naturally concentrate their attention on growing crops like cotton or the sugar-cane. At the same time it is very difficult,—I feel as a practical point it would be very difficult—for the provincial legislature to introduce legislation restricting the cultivation of these crops because there will be a great uproar on that question and those people owning these lands will naturally demand that since Government have charged them the maximum price for these lands, they should be given a free hand to grow whatever crops they choose. So the only point will be, as has been pointed out, persuasion,—considerable persuasion not only by propaganda but by other methods also whereby people should be encouraged to grow fodder crops and leguminous crops. Sir, in 1932 when the barrage began to function, Government had taken up the revision of settlements, and in those settlements the Government made a great mistake, if I may say so, in enhancing the land assessment by one hundred per cent.; in the case of crops like gram and *mutter* the assessment was at once increased by one hundred per cent. on these fodder crops and that has proved as a very great deterrent to people to grow these crops and experience during the last five years ever since the barrage has functioned in Sind shows that from year to year the cultivation of these leguminous crops is going down and, as you will find from the figures, the cultivation of fodder crops has considerably gone down in Sind. It has, become, therefore, a serious problem—which was also considered at the Provincial Board of Agriculture as well and the Lloyd Barrage Committee—and it was considered that special measures should be adopted by the Provincial Government to see that these fodder crops and leguminous crops should be encouraged and the people should take these crops systematically and which they should grow every year. I am emphatically of this opinion that one of the main considerations for these people taking up these crops will be that the assessment should not be so high that people should feel it difficult to grow them. At present the tenure of lands is this, that the Zamindar is the owner of the soil and pays the land assessment direct to the Government. The cultivator shares fifty per cent. of the produce with him in kind. Now the Zamindar will naturally feel that when he is responsible to pay the entire Government land assessment and when the crop which is grown mainly for the purpose of maintaining cattle is made for the benefit of his cultivator and since it is very difficult for him to realize any fresh amount for the crop although he will be compelled to pay the assessment to the Government, it would therefore be perfectly in the fitness of things if the assessment is considerably lowered down in order to make it possible for the owner of the soil to pay assessment to Government. Sir, the difficulty really comes in there that the Zamindar has to say whether he will make two ends meet, whether he will be able to get enough out of his land to pay his assessment to the Government, and one tendency that I find now is for owners of land during the last five years to concentrate more and more on money crops. And, Sir, the reason why these crops were preferred by the cultivator are that these crops like *mutter* or gram do not require any irrigation. You can even do without water supply in the rabi season, whereas for berseem irrigation is necessary and at the

same time the preparation of the soil takes a considerable time and it involves considerable labour. I therefore think that while drafting this resolution this point should also be taken into consideration, which is also in consonance with the special conditions obtaining in the Province of Sind.

Mr. W. J. Jenkins : Sir, I do not intend to go into the provincial details of this problem but I should like just to refer to one or two broad items that are for consideration and to make one or two suggestions. Firstly, Sir Bryce Burt has suggested that the Agricultural Department should definitely pay attention to securing the diversion to fodder production of a part of the area released by the introduction of heavier yielding and more profitable crops. Unfortunately we have been given no idea as to how this admittedly desirable result is to be achieved and personally my own experience has been, particularly in Sind, that the introduction of crops affording a better return to the cultivator generally tends to increase the area under that crop and so make it much more difficult to get any restriction on area adopted. On the other hand, the Agricultural Departments have, for many years, been urging upon the cultivators to extend the cultivation of leguminous fodder crops in the interest of improved rotations. If our efforts in this direction have not been successful when the object was to increase the value of these cash crops, I think it is going to be increasingly difficult when the object is to improve the cattle in which, up till now, cultivators took very little interest. The Indian cultivator is of the same opinion as Dr. Voelckes that the growing of green fodder crops is of little importance whatever in the *maintenance* of cattle. And I think the truth of that is borne out by the fact admitted by Mr. Ware that only half a pound per day is available per head to the cattle of India in the way of green fodder. The question is different when we come to the *improvement* of cattle and the fact that this subject is being discussed here is evidence of the increasing interest taken in cattle improvement. I should like to suggest that there are two methods by which this can be done. Firstly, I think there is a great possibility of increasing the cultivation of mixed crops, one of which is a leguminous crop or fodder crop of some kind. That obviates the difficulty of the cultivator having to reduce the area under his cash crops to which he is so much attached, and at the same time it will have the desirable result of improving the outturn of the cash crop if a leguminous crop is included in the mixture. Most agricultural officers in the provinces will be able to state instances where this has already taken place.

My second suggestion arises out of the proposals made earlier in the meeting about the development of waste lands, firstly through grazing, then through the grass cutting stage, and finally I think it would be possible in many areas to develop to the third stage, that of fodder cultivation. It should be a perfectly easy thing for local Governments to give out the best of these lands to cultivators on conditions which include the cultivation of fodder, as part of the tenure conditions of the land, or on the other hand, to give them out at concession rates on condition that leguminous fodder crops, or a certain percentage of them, were included in the cultivation. Unless some such inducements are made or, unless compulsions are enforced, I do not think we can compete with the rainfall and the prices of agricultural produce in dictating what the cultivator should grow.

In regard to berseem I have nothing to say except to mention the difficulty experienced in Sind that berseem requires double the irrigation water than the *rabi* cash crops which it is intended to replace. That made it a very great problem for cultivators to take up berseem cultivation on any large scale.

Mr. D. R. Sethi : Mr. Jenkins has brought out the point that I wish to bring out in connection with the cultivation of berseem. The department of Agriculture in Bihar has been doing everything possible in the way of investigating the possibilities of growing fodder crops. We have grown berseem very successfully not only on the Chota Nagpur plateau but throughout the plains. The difficulty of getting berseem introduced into the cropping scheme of the countryside is irrigation. More than 2/3rds of our province is rain-fed ; the remainder is mostly under paddy. Whatever land is available for berseem will require in most cases lift irrigation. Mr. Sayer told you that he irrigated his berseem at Pusa up to centrifugals but he did not tell us exactly what the cost was. My experience is that berseem requires for every irrigation not less than 80,000 gallons of water. If this amount is pumped either from tube wells or from any other source by means of centrifugal pumps, driven by oil engines, the cost would be in the neighbourhood of Rs. 2-12-0 to Rs. 3 per acre per irrigation. This crop requires about 8 irrigations in the season and as such its cost would be about Rs. 24 for irrigation alone which is much more than what it costs to irrigate sugarcane. It is, therefore, difficult to see how the cultivator can be induced to grow berseem when he has to spend this large amount on irrigation alone. The cultivator understands the rotation of crops fairly thoroughly. Little mention has been made about rice which is grown on a very large area not only in Bihar but in the neighbouring provinces of Bengal, Orissa and the Central Provinces. I am now talking from personal experience of Bihar and parts of Orissa. It is well known that the cultivator practises what may be called a rotation on his rice lands. Before paddy is harvested he broadcasts in the standing crop a leguminous fodder crop which in most cases is 'khesari' and he utilises this mainly as fodder for his cattle. I have had now over 23 years' experience in those parts of the country and I cannot think of any more suitable crop which with the least amount of expenditure will give to the cultivator as big a return in fodder cultivation as khesari does.

Coming to the question of improved varieties of crops, all of us who have been engaged in that work fully realise that to get the full benefits from improved varieties they must be accompanied by better cultivation and better manuring. Without these they are perhaps a bigger curse to the cultivator than his own old crops were. They impoverish the land and you draw on your banking account with the result that very soon there will be nothing left. The problem of making land surplus is therefore a problem of rupees, annas and pies. The cultivator has not got the means at present to put in all the manure and cultivation necessary to get the full benefit through the improved varieties that we are able to put out. And until and unless ways and means are found which will enable him to get more from his one acre than he is getting at present, to expect him to set apart any of that land for fodder cultivation is, I think, quite impracticable.

Chaudhri Hans Raj Saini : Sir, the importance of cultivating fodder crops purely for the purpose of feeding animals has been realised by the Punjab zamindars for a long time. Figures show that out of the total area of 9 million acres under fodder crops in the whole of India, nearly 50 per cent. is in the Punjab, and the area under fodder crops forms 15 per cent. of the total cropped area in this province. It has been suggested that by the cultivation of improved varieties of cash crops certain areas can be made surplus and can be utilised for fodder crops. This can be considered in another way, that is, by the improvement of cultivated fodder crops which are already under cultivation and by producing better yielding crops the same area can be made to yield more fodder. Bearing this in mind, intensive work on the improvement of fodder crops was started in the Punjab about a decade ago, and during this period a large number of leguminous as well as non-leguminous crops giving better yields than those already under cultivation have been produced. We are in the fortunate position at present of recommending to the zamindars of the Punjab much better varieties of crops, i.e., not only crops giving better yields but crops which can be utilised for special purposes, those which can supply green fodder during transitional periods of the year. In order to solve these problems various crops were tried in the Punjab and some of them have been found successful and give heavy yields of green fodder. Then, selections made from the indigenous crops have also given very good results and they are being taken up for cultivation and gaining in popularity day by day.

Colonel Noel mentioned that there is a large demand for the seed of berseem from his own province. Most of the demand comes from the Punjab because the zamindars do not keep seeds for their own purposes for sowing next year. The chief difficulty about berseem is that the zamindars in the Punjab are tempted to feed it green. The chief utility of berseem lies in the fact that it supplies green fodder during early summer months when there is a scarcity. A large part of the seed has to be brought from outside. At first it was thought that berseem does not set seed in the Punjab but later on it proved to be a good seeder and after two cuttings of green fodder about 5 maunds of seed can be obtained. In most parts of the province and for the irrigated areas we have been able to work out schemes for a supply of green fodder throughout the year and animals can be fed upon it. Further, for the barani areas where the rainfall is something like 25 inches a scheme has also been worked out and it has actually been tried at the Rawalpindi agricultural farm where we cultivate elephant grass, sorghums, rapes and oats, etc., thus getting a sort of continuity over a greater part of the year. Where the rainfall is below 25 inches we have bajra, jawar, etc., and varieties of these crops are being given out to zamindars. Therefore the question for the Punjab zamindar is the introduction of better yielding varieties, that is, varieties which while giving greater yield will give more fodder to the zamindar.

Chairman : I think we have had enough discussion on this and we shall go on now to the next item.

ITEM 3.

Mr. F. Ware : I think I should commence my introduction to this item on the agenda by referring to the absence of Sir Arthur Oliver which

I am sure we all deplore. As you all know, for the last 7 years he has been doing his utmost and working extremely hard for the improvement of India's livestock industries and I am sure that he himself would very much like to be with us today at this conference which in some ways is the culmination of his efforts. And when I say I wish he had been here with us, I think I should remind you what he had particularly in view in regard to this matter of developing India's livestock industries. He has, I think, already in his numerous articles and notes expressed the opinion that what is required in this country more than anything else is a self-contained organization for animal industry. He has also stipulated that this organization should be headed by a livestock expert of some kind and that he should also have a separate budget under his control, and I would ask members of the conference to try and bear that in mind as we proceed with our discussions. I am not going to attempt to show how that can be fitted into the general scheme of things in the different provinces, but I hope perhaps some of those who will follow me will be able to make acceptable suggestions. What I am going to do is to say a few words about this organization and what it should contain in the way of staff. I think it will simplify matters if I describe it under three heads,—I would describe them as the head and tail and middlepiece. With regard to the head of this organization, as I have already said and as Sir Arthur Olyer has pointed out, there should be an officer who is an expert in livestock matters in charge. It is possible that he himself will be an expert in only one branch of the animal industry, and therefore he will require assistance in the other branches. Those branches are,—first of all I would put disease control which, although we have made a considerable amount of advance, is still the most important item in livestock improvement in India; secondly I would put nutrition. At the present time most of our animal nutrition workers are concentrated in research institutes and laboratories, but I look forward to the time when we shall have nutrition officers at work in the field. I dare say some of you have seen a recent proposal in regard to human nutrition that each Director of Public Health in the province should have an officer to help him to devote his attention and time to the nutrition side, and I think we should have something of that kind in our animal industry department in due course. If the officer in charge of this organization is not an expert in nutrition matters, he would require some one to help him. And lastly he will require an expert in dairying if that side of the subject is going to be developed.

I will now pass on to the tail of this organization. What I mean by that is that we must have a lowly paid agency to do simple items of work connected with livestock improvement if we are going to get our results across to the villages. H. E. the Viceroy referred to that himself in his speech yesterday, and it is a point that has often been emphasised on many occasions recently both in connection with livestock improvement and public health work. In order to meet this demand at our meeting of the Animal Husbandry Wing held at Madras in December last, we recommended that a cadre of stockmen should be recruited and attached to the department concerned for work under supervision in the villages. In the note on this subject will be found the items of work which these men will have to perform after a short term of training. I won't go into the details of that question now. Those two parts

of the organization, I think, I have already dealt with, and we now come to what is really the most important in some ways, and that is to fit in the middle piece we must have as large a body as possible of well trained men doing what I prefer to call spreading the gospel of livestock improvement work throughout India, doing propaganda work acting as our field agents directed from the centre. Details of work that these men will have to do will be inspections of all kinds, inspection of animals, inspection of registers, inspection of the work of societies dealing with livestock improvement and so on, and these men are also required to supervise the work of the proposed stockmen.

Now, Sir, the point arises as to how we are going to obtain this large body of men, and I would remind members of the conference that yesterday some of them raised the question of finance. It was stated, I think, by some provinces that unless the Government of India came forward with financial help it would not be possible to do much in the way of improvement. I mention this now to show how in my opinion it is necessary to make as much use as possible of suitable existing staff. It is only natural, therefore, that I should refer to the question of making use of the executive veterinary staff where it is not used at present. These men by reason of their training and constant association with animals, I think we must admit, are suitable either with limited training or without training for what is called livestock improvement work. I am going to give you a few figures to show what is being done at present, and what we have available in the existing staffs. If we take Madras first, I understand that the number of people in the Agricultural Department employed on livestock improvement work is not more than 12; on the other hand, Madras has a total of 297 in their Veterinary Department none of whom are used on livestock work. In Bombay the Agricultural Department has 21 on their staff who are doing real livestock improvement work. In that province there are 152 in the Veterinary Department and a number of them could be employed on livestock improvement work. Then coming to Bengal, Bengal has 6 men who are doing livestock improvement work, whereas use might be made of a majority of the 158 veterinary men. I need not refer to this point any more, because they are all the same until we come to the Punjab. In the Punjab 11 of the Agricultural Department are doing livestock improvement work, but their staffs are augmented by 441 veterinary men most of whom are employed on livestock improvement work. Now, I submit that all these figures are very illuminating, and I hope that they will convince all of us that it is necessary to make more use of all these men who are available. One of the objections to making use of the executive staff of the veterinary department in some provinces has been that some of these men are employed under District Boards and are not controlled in the ordinary way by the Director of the Department. I think now is the time for us to take up that question in all seriousness. As long ago as 1927 the Royal Commission on Agriculture recommended that in provinces where they were not provincialised, the duties of these people should be defined in such a way that ordinary dispensary work should be a charge on local funds, but that contagious diseases work should be done by the provincial staff. That is essential if we are going to have complete control over contagious disease so that for that purpose alone it is necessary for Provincial Governments to take up this

matter. And I suggest, Sir, that this is a favourable opportunity to take it up with a view to using these men not only for disease control but also to help us in this subject of livestock improvement which we all have so much at heart.

Chairman : I think it will probably suit the convenience of the members of the conference if we adjourn now and meet again at a quarter past two.

The Conference then adjourned for lunch till 2-15 p.m.

The Conference re-assembled after Lunch at 2-15 p.m. The Hon'ble Kunwar Sir Jagdish Prasad was in the Chair.

Chairman : I should like if possible to finish the discussion on this subject by about a quarter past three so that we can take up the draft resolutions which have been circulated to members.

Dr. W. Burns : In following Mr. Ware on this subject I am reminded of the notice, " Electric Power Station. 10,000 volts. High Tension. Keep off ". But since the matter has come up many times and we know its various aspects, I do not think that there is any likelihood of my saying anything that is necessarily inflammable. At the same time, it is a matter of fact that there has been some heat in previous discussions on this matter. I myself have probably contributed to it since as Director of Agriculture my feelings on the subject were considerably warm, but the matter has been before us for so long and in so many different aspects that I think we ought to be able to consider it in a more or less objective manner.

Sir Arthur Olver has for many years pursued with the utmost tenacity a particular line of progress with a particular aim in view which has been set out before you by my colleague, Mr. Ware, this morning. In the course of the various arguments that have been from time to time put forward with regard to that aim and the means of obtaining it, there have always been two very strong or supposedly strong arguments one being what was done in the Punjab and the other being what was done in other countries. In the course of a little study of the subject I had occasion to collect a certain amount of information from other countries and if you will have a little patience I will just quote four different things that I have come across, two from the United States, one from Canada and one from South Africa. The United States Department of Agriculture has issued a booklet of their own on the United States Department of Agriculture, Its Structure and Functions (that is the Federal Department, of course). We find that it is split up into departments—Bureau of Agricultural Economics, Bureau of Agricultural Engineering, Bureau of Animal Industry, Bureau of Biological Survey, Bureau of Chemistry and Soils, Bureau of Dairy Industry, Bureau of Entomology, Bureau of Plant Industry, etc. If we look up the Bureau of Animal Industry, we find the principal lines of work are distributed to the animal husbandry division, animal nutrition division, biochemic division, experiment station, field inspection division, division of hog-cholera control,

meat inspection division, packers and stockyards division, pathological division, tick eradication division, tuberculosis division, division of virus-serum control, and zoological division. If we come to plant industry, it is not put up in such a tabular form, but we find :

“ Widely varied research is conducted in the fields of agronomy, horticulture, physiology, biochemistry, genetics, and technology with special reference to cereal and forage crops ; to drug, sugar, rubber and fiber plants ; to cotton and tobacco ; and to fruits, vegetables, nuts other economic crop plants ”.

Then it also includes cotton improvement by various experiments, etc. In the letter that was sent with the booklet it was stated :

“ As to the research activities in which you have expressed particular interest, the breeding investigation with beef and dual purpose cattle are a responsibility of the Animal Husbandry Division. This Division also co-operates with the newly created Animal Nutrition Division in beef and dual purpose cattle nutrition investigations by conducting the practical feeding trials with these classes of livestock. The Animal Nutrition Division places most emphasis on research in fundamental problems of feeding and nutrition, especially those phases involving elaborate laboratory technique.

The research in the problems of breeding and nutrition of dairy cattle is the function of the Bureau of Dairy Industry of this Department and your letter is being referred to that Bureau for such information thereon as they may be in position to send you.”

Leaving the Federal Department of Agriculture and turning to agricultural organisation in individual states I am informed by correspondence that “ the chief function of the Agricultural Experiment Stations in the United States is to provide for research in agricultural subjects as well as to disseminate the knowledge pertaining to agricultural improvements to the general public. In other words, the functions of these Experiment Stations are similar to the Agricultural Departments in this country (that is, India), although as a matter of convenience most of these stations are located at the University centres and form a part of the agricultural colleges ”. In that connection, one of the best known of these agricultural experimental stations is the one at Iowa, and I find a list of sections and sub-sections as follows :—Agricultural engineering section, Agronomy section, Animal Husbandry Section which has the following sub-sections : Sub-section for animal breeding, sub-section for animal chemistry and nutrition, sub-section for animal production, sub-section for dairy husbandry, sub-section for meats, sub-section for poultry husbandry. There are other sections also. The forwarding letter says :

“ The veterinary research is carried on in the veterinary school as a separate department, comparable to such departments as surgery, veterinary medicine, etc. You will understand, therefore, that veterinary research is not in the Agricultural Experiment Station ”.

In the case of Canada, again, dealing with the Federal Department of Agriculture there, it includes the following branches. They do not

call them bureaus but call them branches. Those branches are, Experimental Farms Branch, Dairy and Cold Storage Branch, Health of Animals Branch, Live Stock Branch, Seed Branch, Entomological Branch, Fruit Branch, Agricultural Economics Branch, Publicity and Extension Branch and Library. In the forwarding letter they say that all officials in the Health of Animals Branch are veterinary officers, and in the Live Stock Branch and Animal Husbandry Division of the Experimental Farms Branch the officials are agriculturists. (In the case of South Africa the department is sectionalised into eight divisions. The words division, brands, etc., vary from place to place but they mean the same thing.) There are :

- A. The Secretariat.
- B. Division of Veterinary Services.
- C. Division of Chemical Services.
- D. Division of Forestry.
- E. Division of Plant Industry.
- F. Division of Agricultural Education and Extension.
- G. Division of Economics and Markets.
- H. Division of Dairying.

In further elucidation of this, the forwarding letter states :

" I have to inform you that Dairying is entrusted to one Division under the control of the Superintendent of Dairying, whereas Animal Husbandry is entrusted to three separate Divisions, viz., Plant Industry in so far as pasture questions are concerned, Veterinary Services in so far as fundamental questions are concerned, and the Division of Agricultural Education and Extension in respect of breeding and production "

There you have a whole set of varied types of organisation and the thing in which they most remarkably resemble one another is this. that you have got these various activities entrusted to one very strong and powerful department. One of the real difficulties in discussing this question for us in the last four years has been that the whole tone and trend of the discussion has been separatism. In other words, there has been an insistence on a separate budget, on a separate personnel, and a separate appeal to the cultivator. I can quite understand that line being taken. At the same time, it has undoubtedly been one which has aroused a certain amount of I think quite understandable feeling in connection with the possibility, as it appeared, of an important branch of agricultural activity being split off from the agricultural department and added to the veterinary department. I put the matter very crudely, but that is how it has appeared. I have discussed this matter with my colleague, Mr. Ware, and we have attempted to consider this objectively and sanely and I think that we are agreed that the real solution for this type of difficulty, which will be chronic unless we attempt to get some kind of a reasoned solution, is not separatism but unification. In other words, that the real solution is a powerful unified department of agriculture in which there will be only

a single appeal to Government for funds and there will be a unified appeal in the form of propaganda to the cultivator. I trust that I am expressing correctly what I understand was the outcome of our private talks. Now, in a case like this it is necessary to deal with the peasant's crops, with the peasant's cattle and with the peasant's economics, and I do not see how you can have a powerful department unless you have at least three divisions which will deal with these three aspects. For that reason it seems to me that not only is it necessary to have your crops and cattle dealt with thoroughly by the divisions that are concerned with them, but you must bring in co-operation as well. We have in the past in most provinces had a comparatively weak appeal from three separate and to some extent competing departments with regard to our various propaganda and any kind of unification that will bring in the crops, cattle and economics together seems to be one that will very greatly strengthen the appeal of our work which is being done in connection with the peasant. I think we ought to regard ourselves as people of the first importance. It is easy to say in public speeches that 70 per cent. of the population of India depend on agriculture, but we will not get that attention paid to it until we have a unified department that is sufficiently powerful to represent that 70 per cent. in the way that it should be represented both upwards and downwards in all these activities. That is why I feel that this is the best solution of the matter. I do not suggest that this matter should be rushed. It is not a case for drastic, violent reorganization. There are individual and departmental rights and sensibilities that have to be considered, but at the same time it seems to me that unless we do face up to the problem and get some kind of solution of this type, some kind of guidance, we stay where we are. Therefore, gentlemen, I feel that a way out in these terms is the best escape from what has always promised to be an impasse otherwise.

The Hon'ble Rao Bahadur Chaudhuri Sir Chhotu Ram : I am very glad to note from one of the papers that have been supplied to us that the Government of India contemplates having a central institute for imparting higher training to those who would be employed in what is known as the superior service in this line.

We have suffered a good deal for want of such training. It is very difficult in the first instance to secure admissions in England. Moreover it is more expensive to send our young men there for training. Therefore, I welcome the proposal of the Government of India for having a central institute for imparting such training locally and I wish to add that this proposal should take material shape at a very early date.

After that I have to offer a few remarks with regard to the increase of the technical personnel. Here again the limiting factor is finance. The Punjab is an agricultural province and I have spent the greater part of my life in the advocacy of all those activities which will bring added income to the agricultural classes. I may be allowed to draw your attention to the fact that the province of the Punjab has been spending a good deal on livestock. As I told you yesterday, we are maintaining a farm of over 40,000 acres at Hissar which costs us something in the neighbourhood of 3 lakhs a year. Besides, we have half a dozen private farms held by private grantees. The total area of these farms is 28,000 acres and the capitalised value of this area is easily in the neighbourhood of 2 crores and on a return of 4 per cent. per annum, I think the

Punjab may be regarded as spending 8 lakhs a year in connection with these farms. Apart from this item we are spending over 20 lakhs a year on the Veterinary Department and of course a good deal more is being spent on the Agricultural Department which also has a good deal to do with the livestock industry. Our total budget for the year on agriculture is, I think, 32 lakhs, so taking the two departments together, that of agriculture and of veterinary, we are spending 52 lakhs a year, apart from the capitalised value of these farms. Therefore the Punjab may find it very difficult to add to its present commitments to any very large extent. We do our best to have some suitable increase made to our existing staff but as my friend, the Nawab Bahadur of Dacca, said yesterday, perhaps it will be reasonable for us to make a demand for subsidies from the Central Government for the livestock industry. After all the Central Government is subsidizing so many industries both directly and indirectly. The Tariff Board recommendations cost the Central Government a good deal and I may be allowed to suggest that the Central Government has done far less to promote the industries which go to benefit the agricultural classes. When so much is being done for the benefit of the industrial classes, there is no reason why the Central Government should not be able to make substantial grants for the promotion of an industry which goes to benefit mainly the agricultural classes. It is impossible to exaggerate the importance of the livestock industry. India as a whole is mainly an agricultural country and in the words of His Excellency the Viceroy the whole burden of agriculture rests upon the patient cow and the bullock and the livestock industry is naturally very much connected with the cow and the bullock. Therefore it is up to the Provincial Governments as also the Central Government to spend as large sums of money as they possibly could. I have already said that the commitments of the Punjab in this respect are fairly heavy. I may also be allowed to draw the attention of the Conference to the fact that local bodies and district boards are not in a position to add a single penny to their present expenditure. They have imposed all the taxation which they could under the law as it stands. They have raised the local rate cess on agricultural land to the maximum they could under the law. They have imposed professional taxes and there are no other taxes which district boards can impose on the population which resides within the limits of their jurisdiction. Therefore they have really exhausted all their resources and the whole of their annual income is committed to the full to the last pie on the maintenance of existing services. Therefore this delusion should be removed once for all. Therefore it is up to the provincial Governments and the Central Government to add fresh amounts to the monies that are being spent on the livestock industry. While we are not in a position to have highly trained staff drawing very large salaries, it is absolutely essential if we want to promote the interests of the livestock industry to have the staff to perform the duties which have been enumerated in the excellent note which was supplied to us on the subject. I have summed up the general position so far as the Punjab is concerned. Any sub-heads of the proposal and any minor items will be dealt with by the Director of Veterinary Service, if necessary.

Chairman : I think it will probably help the discussion of this subject if members will turn to the draft resolution on Subject No. 3, which

has been circulated. I should like members of the Conference who do not find themselves in agreement with the draft to let the conference have their views.

Mr. P. B. Richards : The opening sentence of Resolution No. 1 on Subject No. 3 states very definitely that there is a need in every province for a livestock department or division with a separate budget for livestock improvement work and controller by a livestock expert whose whole time is devoted to that subject.

Now, Sir, much has been said in recent years about the work which has been done in the Punjab. Very little has been said, although much has been done, about the work in the United Provinces. I would not attempt to develop the reasons at the moment. Our organisation in the United Provinces has been for the last 16 years somewhat different from that in the Punjab. Up to that time the work was conducted by a Veterinary Department. The Local Government then decided to appoint a livestock expert to deal with our cattle problem. Such a one was appointed and for a number of years his sole duties were the organisation of our cattle breeding farms, the improvement of our local breeds or the acclimatization and development for local conditions of breeds not peculiar to the province and the distribution and supervision of stud bulls. The United Provinces is a very big area and the staff which could be placed at his disposal was small. For reasons which I shall explain presently it was decided that it was much more desirable that the cattle breeding in special intensive areas should remain, as also the farms under our cattle breeding expert but that the development work in most of the provinces should be carried out by the agricultural staff as such. It was also considered, and I think very rightly that an area like the United Provinces, where there are few professional cattle breeders and where our ryot with his few acres of land is the cattle breeder, it was absolutely essential that our cattle expert should be in close touch with agricultural conditions, so that he should not go astray. Consequently instead of being put as a whole time officer doing nothing but cattle breeding, he controls our cattle improvement policy, obtains stock for issue and also in charge of agriculture. Up to a certain point it is a very effective organisation. I say, up to a certain point, because our agricultural staff in the districts has a lot of other important work to do and it is physically impossible even with the whole of the available staff to be able to give so much attention to the animal improvement work as he would wish. That however is not an intrinsic defect in the system. That is a defect in the number of staff which we have available in the United Provinces for agricultural work in general. Now, I think we may say we are fully satisfied that our scheme in the United Provinces is a sound one and I feel very diffident in accepting the statement which is included in the first sentence. In this connection I would like to draw your attention to the fact that in the report of the Royal Commission on Agriculture para. 208 it is said that the control of livestock improvement should be entrusted to the Agricultural Department. In paragraph 191 it specially commended the adoption in other provinces of the policy pursued in the United Provinces. I would draw the attention of this Conference to those points lest it should think that the Royal Commission had made recommendations, as it might quite well have made recommendations, which could not be accepted.

Mr. S. Lal : There is one point on which I would like to have information. What is meant by the words "separate Budget"? If it is contemplated that we should have a separate Department as a livestock department in addition to the Agricultural and Veterinary Departments, I think that for the smaller provinces that would be an impossibility. We have considered the question and we do not propose to have a separate Department. We would like to place the money available for livestock improvement at the disposal of one of the two Departments. It would be impossible to create a separate department for livestock.

Sir Bryce Burt : By "separate Department" is meant separate funds—not a separate department as such. What all of us felt was that there have been too many transfers. We do feel that the officer responsible for livestock improvement, that is to say, breeding, dairying and such-like should be assured of a regular budget, a separate allotment of funds—not a separate department.

Mr. W. J. Jenkins : Sir, with regard to resolution No. 1, I may state that the conditions required here already exist in the Bombay Presidency and therefore it does not appear necessary for this Conference to draw the attention of all provinces to the need for such an organization. The reorganization of the Animal Husbandry Department in the Bombay Presidency is at present under the consideration of the Bombay Government and I am not in a position to give any remarks as to the policy which will be decided upon. From my personal point of view, I agree with the suggestions thrown out by Dr. Burns because I think, after listening to H. E. the Viceroy's speech, that there can be only one opinion in our minds and that is the need for concerted action by everybody concerned in livestock improvement work. I would just like to dwell for a minute on a point raised by Mr. Ware's speech which I think is liable to give rise to a misconception. He stated, for instance, that in Bombay there were only 21 men of the Agricultural Department engaged on livestock improvement work. That is definitely not correct. Out of the 260 people in the Department about half are dealing with livestock work in the districts in addition to their agricultural duties and I think that point should be nailed down for ever,—it is not only the staff of the Livestock Section of Agricultural Department who are doing livestock improvement work but a much greater proportion of the staff of the Agricultural Departments. The only other point I wish to mention is the question raised in the second part of resolution No. 1 and I think I have the agreement of the Honourable the Minister for Agriculture, Bombay, that a policy which would embrace these kindred subjects under one Minister would be acceptable. In conclusion, I would only like to state that I personally welcome the recommendations of the Animal Husbandry Wing regarding formation of a cadre of "stockmen" for livestock improvement work in villages and specially recommend it because it indicates a realization of the necessity of choosing these people from the right classes,—that is, from people with agricultural experience and training. Personally, I would welcome very much a solution on the lines indicated by Dr. Burns.

Chairman : As far as I can see, the only dissident is Mr. Richards in regard to the draft resolution on this subject. Am I correct in this statement? Will Mr. Richards kindly suggest any amendment he likes?

Mr. P. B. Richards : I should leave out the words "livestock department or division". If one could know of the definition of a "division", one might be able to suggest a suitable amendment. There is a further difficulty about this. With regard to the point that the whole time of an officer should be devoted to this subject, that is a point upon which I feel very strongly that the livestock expert must be in close touch with agriculture : and if he has only one district to look after, as long as he is doing his duties with a knowledge of what the real cultivator wants, that is all right.

Chairman : I have heard nothing so far about the third part of this Resolution.

The Hon'ble Raja Maheshwar Dyal Seth : I think that the idea was that these resolutions should be passed as the result of the discussions which we have held yesterday and to-day but I find that this matter was never actually discussed.

Chairman : In order to concentrate the discussion we have put it in the form of this draft resolution. The matter is still under discussion and in order to crystallise the discussions we have put it in the form of draft resolutions.

The Hon'ble Raja Maheshwar Dyal Seth : This is a matter of great importance. Our course of action may be contrary to what Dr. Burns has recommended and what is mentioned in resolution no. 1. As a matter of fact, in the United Provinces we have not provincialized our veterinary staff but if and when the department is reorganized I should personally not be surprised to find that they actually decided upon a policy contrary to that laid down in resolution no. 3 and I should think that the lines advocated by Dr. Burns just now will give us a suitable organization to deal with these matters in a more suitable way than what is contemplated heretby resolution no. 3.

Mr. V. R. Phadke : With regard to item no. 3, Mr. Ware has already given you a synopsis of the note published by the Imperial Council of Agricultural Research under different heads, and also some figures for the provinces. I am sorry to say that owing to financial stringency in matters particularly veterinary, no progress has been possible in India on the lines recommended by the Royal Commission on Agriculture particularly I may say so of my province. There was a time when the Reorganization Committee that was appointed in Bombay recommended that the veterinary and agricultural college should be abolished. But fortunately that recommendation was not accepted.

There are only 131 veterinary assistant surgeons, 3 inspectors, one deputy director, and one director, and the money spent is approximately 3.65 to 3.85 lakhs. In recent years the work of the Department, I may say, has considerably increased in adopting improved preventive measures in combating contagious diseases, chiefly rinderpest, by goat virus inoculation. For the most part of the month the veterinary assistant surgeon is on tour on outbreak duty, and it is deplorable that the work of the dispensary has got to be left to the compounders. However, many of the graduates are ungrudgingly taking part in village uplift schemes in many centres of the province. So I am afraid veterinary assistant surgeons in my province could not be spared for livestock work, unless assisted by

- 1 stock-men under the scheme. But owing to financial stringency and as a matter of despair, I take it and as something has got to be done in the way of supplying some kind of low-paid agency for village improvement work, we shall have to utilise the services of these stock-men after being suitably trained in veterinary hospitals, dairies and agricultural schools for a period of 6 to 9 months. These men will have to work under the supervision of the technical staff. It is recommended that these men should be recruited from amongst the ryots knowing the vernacular. I do not think English-knowing boys would be available. What duties they would be called upon to perform have been enumerated in the note. Lastly, I may say that when the curriculum of the provincial veterinary colleges in India would be revised on the lines recommended by the I. C. A. R. a veterinary graduate of the future would be an important asset in undertaking work in connection with the livestock improvement in this country.

Sir Bryce Burt : There is a slight misunderstanding. Resolution no. 3 is in every way supplementary to resolution no. 1 and this is in complete accord with what Mr. Ware and Dr. Burns have put forward. I would like to say one word about the extreme importance of an adequate disease-controlling staff and of the veterinary director having effective control of that staff. Only this week I find that India at present cannot ratify three important international Conventions dealing with animal diseases because we cannot give the required guarantees and we shall not be able to ratify these conventions and give these guarantees until the veterinary directors have effective control of a certain portion at any rate of their staff of veterinary services. Now, Sir, I put it very bluntly because it is a most important matter. What has been put forward here is in no way contradictory to what Dr. Burns and Mr. Ware have said. But I quite see that Hon'ble members hesitate to commit themselves on a matter of policy such as this without mature consideration. I would therefore ask your permission to make a small change in the drafting. With my amendments the resolution will read thus :

" It is also suggested for the consideration of provinces that the best possible use should be made of existing staff and, in particular, that in those provinces which have not completely provincialised their veterinary staffs there should be a clear division of responsibility for veterinary work. Local bodies might be responsible for the maintenance of veterinary hospitals, for the treatment of ordinary diseases and casualties and should retain control of the veterinary assistant surgeons required for that purpose. The rest of the veterinary assistant surgeons would form a disease control staff at the disposal of the Directors of Veterinary Services and those assistants could render substantial assistance in livestock improvement work."

I hope the resolution will be acceptable to the Conference in this permissive form.

The Hon'ble Sir S. T. Kampli : I would like to know whether it is intended by this resolution that the local bodies would be responsible for the payment of veterinary assistant surgeons.

Chairman : I think these are matters of detail which we must leave to the local bodies to settle in consultation with the local Governments. I do not think this Conference should go into these minute details at all. As the resolution is now drafted, it leaves it open entirely for the provinces to make such alterations as they may consider feasible.

The Hon'ble Raja Maheshwar Dyal Seth : We, in the United Provinces, do not agree with the suggestion contained in the resolution. We want to take back the control of the entire veterinary staff and place it entirely under the control of the Director.

Chairman : I shall congratulate you most heartily if you will accomplish that change of policy in the United Provinces of which I have had a great deal of experience.

May I take it that there is general agreement to the resolution as now amended ?

The resolution was adopted.

Chairman : Now, I shall turn to the three resolutions which deal with the first three subjects which the Conference has been discussing yesterday and this morning.

After some discussion the first part of resolution no. 1 was adopted in the following amended form :

“ The Conference having noted the response to His Excellency the Viceroy's Appeal for the provision of funds for the purchase and maintenance of *approved* breeding bulls, being convinced of the necessity for a sustained effort to improve Indian cattle and of the importance of continuity of policy in all livestock breeding considers it desirable :—

- (1) That there should be established in each of the provinces and States represented a provincial cattle improvement fund into which would be paid donations *and other monies* received for the purchase and maintenance of breeding bulls *and other forms of cattle welfare purposes*. It is a sound principle that most of the money should be spent in the district in which it was collected.

SUBJECT NO. 1.

In Resolution no. 1, part (1) the words ‘ and States ’ were deleted.

In part (2) the words ‘ or State ’ were deleted.

Khan Bahadur Chaudhri Mohd. Din : Sir, it is the general policy of the States that a recommendation be added at the end of all the Resolutions that these are commended for their acceptance. The word ‘ States ’ wherever they occur should be cut out.

The Hon'ble Sriman Gora Chand Patnaik : There are only two bodies mentioned in this Resolution. There is no provision for the creation of some other body which may perform the functions. Supposing

- for instance there is an agricultural association and that body might function as the Cattle Improvement Board instead of having another body for the purpose. Why should we not make provision for that ?

Chairman : If you have got another organization there is nothing to prevent you from utilising it. We are not legislating here. We are here merely to get the machinery working.

Lt.-Col. E. W. C. Noel : May I suggest that instead of the word 'cattle' the word 'livestock' may be used. In our province sheep breeding is done on an extensive scale and there is no reason why they should not come under this Improvement Board.

Chairman : There is no objection to substituting the word 'livestock' for cattle wherever it occurs.

PART (3) OF RESOLUTION 1.

Mr. R. C. Woodford : Is it really necessary to have this provision "That the provincial Cattle Improvement Boards would not undertake administrative functions"?

Chairman : It was at the instance of the Punjab Minister that this provision was put in.

The Hon'ble Sir Chhotu Ram : So far as these Boards are concerned, their position might differ from province to province. In every province these Boards will inevitably be composed of both officials and non-officials and non-official element will be derived from all sources. It may be derived from different districts and different divisions and the men sent up by the different districts or divisions might belong to a party which holds views entirely different from those of the party in power. Therefore the party in power cannot be bound down to accept the proposals put forward by this Board. If you entrust administrative functions to this Board, then the Ministry would be bound to carry out their proposals. I think it would be wrong in principle to entrust administrative functions to these Boards as such.

Mr. P. J. Kerr : I have been on several committees *ex-officio*. It does not mean that the expert officer's advice is always taken by the unofficial committee.

Sir Madhorao G.-Deshpande : I suggest that the cattle improvement board should have administrative functions also. You always put in un-official members, but you do not give them any powers.

The Hon'ble Sriman Gora Chand Patnaik : I agree that these bodies cannot have administrative functions, because there will be conflict of interests. Suppose the Board passes some orders which cannot be carried out by the Government. Then the Government might be placed in an awkward position. It is but right that the body should be only consultative and their resolutions should be placed before the Government for such action as they may think necessary. If non-officials want to take part in all these matters, there is the legislature where these things could be discussed. The legislature cannot shut out the non-officials from ventilating their views. Even the Government would be

bound to place their views before the legislature where the non-officials will have an opportunity of expressing their opinion. Therefore the interests of the non-officials will not be disregarded, and at the same time the Government will not be placed in an awkward position. I think it is but right that these Boards should not have administrative functions. I suggest the deletion of the last clause :

“ these would continue to be performed by the expert officers concerned ”.

Chairman : I accept the amendment.

I should like to add that I am not in a position to commit the Government of India to any assistance. I have noted the wishes of the Honourable Ministers that the Government of India should contribute. I want it to be understood that that in no way commits the Government of India to any financial responsibility.

The Hon'ble Mr. G. C. Patnaik : The Ministers also do not commit their Provincial Governments to any of these Resolutions.

RESOLUTION 2.

This was adopted.

SUBJECT 2, RESOLUTION 1.

In line 2, after the word “ grazing ” insert the words “ and grass land ”.

In sub-paragraph (i), omit the words “ the ”, “ and States ” and “ here represented ”.

In Resolution 2, omit “ States ” in line 2. In sub-clause (a) after the word “ shows ” all the words should be omitted and the following substituted :

“ that this is not only a Reserved Forest problem but even more a problem of waste-lands ”.

At the end of the Resolution insert the following :

“ and by the Forest Department on forest lands ”.

Resolution no. 4 was amended and passed as follows :—

The Conference being convinced of the need for a greater attention to the improvement of fodder and its best use and for deliberate crop planning directed to the greater production of fodder crops recommends that such special efforts should be made and such planning should form part of the regular propaganda by the agricultural staff in all provinces. Details must vary greatly with local conditions, but the fullest advantage should be taken of all favourable opportunities such as are afforded by the spread of high-yielding varieties of cash crops and the development of more intensive cultivation due to new irrigation facilities.

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Chairman : I think that finishes our agenda, but I have just received notice from Khan Sahib Gabol to the effect that he wishes to move the following Resolution :—

“ That at the end of one year the Government of India may be informed as to what action has been taken and what progress has been achieved by the provinces on the carrying out of the resolutions passed at this conference.”

What is your chief object of this Resolution, Mr. Gabol ?

K. S. Allah Baksh Khan Khudadad Khan Gabol : My reason is that at the end of one year each province should submit a report to the Government of India. Copies of that report should be circulated to all the provinces which will show what progress has been done by the provinces or whether they should approach the Government of India for financial help.

The Hon'ble Babu Gursahai Lal : I don't think any resolution of this sort is necessary, because some provinces may take up the work at once, and some may take up the work after a year.

Chairman : The general feeling is that this Resolution should not be moved.

K. S. Allah Baksh Khan Khudadad Khan Gabol : My purpose has been served, Sir.

Chairman : I think we have now finished the agenda, and I should like to thank the Honourable Ministers and their official and non-official advisers for having taken the trouble to come up here at great inconvenience to themselves in this trying weather. I am sure that the deliberations we have had since yesterday will produce important results and that they will be seen in the improvement of livestock in the provinces in the not distant future. It is unnecessary for me to emphasise the importance of this subject as H. E. the Viceroy has already said all that has to be said about it in his opening speech yesterday. I am sure that we are all agreed that the Conference where Honourable Ministers have been able to exchange views and also to inform the Government of India about their difficulties has not been void of results. I should like to thank you all, gentlemen, again for having come up to Simla and for the cordial and friendly spirit in which our discussions were carried out.

K. B. Choudhri Muhammad Din (Jodhpur) : May I say, Sir, a few words on behalf of the representatives of the Indian States ? We have derived great benefit from the discussions at this conference and from the observations made by the agricultural experts, and we shall now go back with greater knowledge, and we hope to carry into effect many of the suggestions for the benefit of our people in the States. Sir, this movement for the improvement of the livestock which has been inaugurated by H. E. the Viceroy is a very valuable one. The service to our dumb friends in this case is also service rendered to the cause of agriculture in India, and all this will tend to increase the prosperity of India. If the movement is continued with the same enthusiasm which you, and your staff have shown, then after a few years the beneficial results will be substantial to the peasantry and India will look back with gratitude to the Viceroyalty of Lord Linlithgow whose name will be immortalised.

The Hon'ble Rao Bahadur M. C. Rajah : Sir, on behalf of this conference it gives me great pleasure to thank you for having invited us here to this conference. You have given us an opportunity to meet the various representatives of the provinces and to discuss some of the vital problems affecting the agricultural industry of this country. We also thank you, Sir, for the trouble you have taken in presiding over this conference in spite of the enormous work you have to get through. I also thank the other representatives who have come here and who have given their valuable advice to the conference which has now come to a successful end.

The Hon'ble Mr. B. G. Khaparde : Allow me to join in endorsing every word that has been said by the Honourable Minister from Madras, and we thank you very sincerely for having brought us together which gave us this opportunity to exchange views. I feel sure that some substantial good will result from the deliberations of this conference and India will be benefited in the long run.

Chairman : The conference now stands adjourned. I hope to meet members of the conference in a more pleasant atmosphere at tea.

The Conference then adjourned *sine die*.

APPENDIX I.

Resolutions passed at the Cattle Conference held at Simla, on the 25th and 26th May, 1937.

SUBJECT No. 1.

Resolution 1.

The Conference having noted the response to His Excellency the Viceroy's appeal for the provision of funds for the purchase and maintenance of approved breeding bulls, *being convinced* of the necessity for a sustained effort to improve Indian livestock and of the importance of continuity of policy in all livestock breeding *considers it desirable—*

- (1) That there should be established in each of the Provinces represented a provincial livestock improvement fund into which would be paid donations or other monies received for the purchase and maintenance of breeding bulls and for other forms of livestock improvement. It is a sound principle that most of the money should be spent in the district in which it was collected ;
- (2) That there should be set up in each province either a Provincial Livestock Improvement Board with suitable district or local committees or a provincial Livestock Improvement Association with district branches. It would be for each province to decide what form of organisation to adopt. It would largely rest with district and local committees or branches to maintain local enthusiasm and raise further funds ; and
- (3) That there should be the closest possible liaison between the several Ministries of Agriculture and such Boards and Associations. The precise composition and functions of these bodies is a matter for the provinces to determine, but it is desirable that the Minister should be president except where that position is occupied by the Governor of the Province in which event the Minister would be Vice-President. It would be an advantage if such bodies include in their membership the permanent officials connected with livestock improvement. Provincial Livestock Improvement Boards would not undertake administrative functions.

The Conference noted the unanimous opinion of the provincial Ministers that the Central Government should make substantial grants to provincial Livestock improvement funds.

Resolution 2.

The Conference endorses the recommendation of the Cattle Improvement Subcommittee of the Board of Agriculture and Animal Husbandry that adequate and suitable provision should be made for the proper maintenance, in such manner as may best suit local conditions, of all breeding bulls which may be presented in future.

SUBJECT No. 2.

Resolution 1.

With a view to securing systematic and progressive improvement in grazing and grass-land areas, and the conversion of waste land into useful grazing, wherever that is possible on an economic basis, *The Conference Recommends :—*

- (i) That, in all Provinces standing Fodder and Grazing Committees should be established on the lines recommended by the Board of Agriculture and Animal Husbandry in India ; and

- (ii) That a central committee to co-ordinate grass-land and fodder research and the dissemination of information should be set up by the Imperial Council of Agricultural Research.

Resolution 2.

Whilst recognising that conditions vary greatly in different Provinces and localities the Conference is agreed upon the following general conclusions :—

- (a) The report of the Special Committee on Forest Grazing shows that contrary to popular belief this is not only a Reserved Forest problem but even more a problem of waste lands ;
- (b) That great improvement in existing grass lands is possible by controlling the periods during which individual areas are open to grazing and by limiting the number and species admitted. Without such control deterioration is progressive and frequently the poorest cattle are found where grazing is unrestricted ;
- (c) That good grazing is essential for the production of hardy young stock especially of the draught breeds and is therefore of special importance in all definite cattle-breeding areas.
- (d) That it has already been shown by experiment that, under control, several types of waste land can be improved to yield an appreciable amount of grazing and hay ;
- (e) That there is scope for much useful experimental work on grass-land improvement in many parts of India and that definite schemes of experimental work should be initiated by the Provincial and Central Fodder and Grazing Committees and by the Forest Department in Forest lands.

SUBJECT No. 3.

Resolution 1.

The Conference is convinced of the need in every province for a Live-stock Division with a separate allotment of funds for live-stock improvement work and controlled by a livestock expert whose whole time is devoted to that subject. It is probable that the ultimate solution in each province will be found in the eventual establishment of unified department under one Minister embracing Plant Industry, Animal Industry, the control and prevention of animal diseases, the marketing of crop and animal products and rural co-operation with technical heads for the appropriate divisions.

Resolution 2.

Additional staff of all grades is required for livestock work and much can be done by the creation of a class of trained stockmen : Provided that the Head of the Livestock Division has an adequate supervising staff.

Resolution 3.

It is also suggested for the consideration of provinces that the best possible use should be made of existing staff and, in particular, that in those provinces which have not completely provincialised their veterinary staffs there should be a clear division of responsibility for veterinary work. Local bodies might be responsible for the maintenance of veterinary hospitals for the treatment of ordinary diseases and casualties and should retain control of the veterinary assistant surgeons required for that purpose. The rest of the veterinary assistant surgeons would form a disease control staff at the disposal of the Directors of Veterinary Services and these assistants could render substantial assistance in livestock improvement work.

SUBJECT No. 4.

Resolution.

The Conference being convinced of the need for a greater attention to the improvement of fodder and its best use and for deliberate crop-planning directed to the greater production of fodder crops recommends that such special effort should be made and such planning should form part of the regular propaganda by the agricultural staff in all Provinces. Details must vary greatly with local conditions but the fullest advantage should be taken of all favourable opportunities such as are afforded by the spread of highyielding varieties of cash crops and the development of more intensive cultivation due to new irrigation facilities.

Resolution.

The Conference recommends that the above Resolutions be commended to the notice of Indian States for their careful consideration and such action within their own territories as may suit their special conditions.

APPENDIX II.

Notes on subjects discussed at the Cattle Conference held at Simla, on the 25th and 26th May, 1937.

SUBJECT No. 1.

The setting up of suitable provincial cattle improvement funds on the lines suggested by the Animal Husbandry Wing of the Board of Agriculture as the best means of following up His Excellency the Viceroy's campaign for providing breeding bulls.

Note by Imperial Council of Agricultural Research.

Though there are a few outstanding examples of individual effort it is broadly correct to say that cattle improvement work in India is carried on by Government either independently or through certain private or semi-official organisations. The activities of Government include the breeding of bulls in Farms and distribution in villages of these bulls as well as other approved animals bred by private individuals. In the past each province has pressed the need for some system of subsidy either for the purchase or maintenance of these animals or both. The system differs from place to place, but in essence it is either the payment of a fixed sum of money for maintenance, the offer of a bull free, a contribution towards its purchase, or some other form of premium. In many instances the cost thus incurred is shared by the local Government and the District Boards. The number of bulls thus distributed in each province is quite inadequate to effect any marked improvement on the huge livestock population, but the response received to the appeal issued by His Excellency the Viceroy for the donation of pedigree bulls has been so good that this should go a long way to fill up the gaps, provided that suitable organisations are set up to secure continuity of effort. Two of the chief desiderata are:—(i) to make arrangements for the registration of the accredited progeny of all approved bulls, a point which will be elaborated later, and (ii) the establishment in each province of a cattle improvement fund adapted to local conditions, as recommended by the Animal Husbandry Wing of the Board of Agriculture and Animal Husbandry last December.

In discussing measures necessary for giving full effect to the scheme of cattle improvement initiated by His Excellency the Viceroy, the Advisory Board of the Imperial Council of Agricultural Research, at its meeting held in July 1936, recommended *inter alia* that for the maintenance of bulls it is necessary to establish definite funds, the proceeds of which should be devoted partly to the purchase of bulls and partly to their maintenance. This recommendation not only stresses the necessity for funds but also emphasises that, whenever bulls are purchased or presented, adequate provision should be made for their maintenance. The Livestock Improvement Sub-Committee of the Animal Husbandry Wing, which met at Madras in December 1936, went a step further and recommended that in future no gift of a bull should be accepted unless it is accompanied by suitable provision for maintenance. It will be recollected that such provision was made in His Excellency's original gift and by many of the donors who followed his example.

It is clear that what is needed in each province and State is a permanent fund controlled by a suitable permanent organisation, which will see that the money available is utilised to the best possible advantage, and which should perhaps be largely un-official in character.

Certain tentative steps have already been taken. At the Centre there has been set up a fund, which is composed of donations received by His Excellency the Viceroy direct, and contributions from this are being utilised in the manner specified by the donor.

In Madras it is proposed to start a central fund out of donations received. This fund will be dealt with by the Provincial Economic Council and distributed as required to District Boards.

In Bombay some difficulty is being met with in utilising the donations because some donors desire to earmark their gifts for particular villages in a manner incompatible with any definite scheme of livestock improvement. Attempts are being made to create a Central fund to be placed at the disposal of the Livestock Expert for use for Cattle improvement.

In the Punjab all moneys are paid to District Boards for supplementing their normal efforts at cattle improvement.

The Cattle Breeding policy of the United Provinces is controlled by a Provincial Board. This Board has District Cattle Improvement Committees under it, and all donated funds are allotted to these committees.

In Bihar and the Central Provinces, Provincial Cattle Breeding Associations have been formed, and these will presumably have funds at their disposal for distribution.

A Cattle Breeding Society has been formed in Orissa with His Excellency the Governor as Chairman. It is proposed that this Society shall purchase and maintain bulls and control breeding policy.

In Assam it is proposed to establish a Cattle-Breeding Association for the Province, with local branches. This Association will control breeding work and will deal with the donations of bulls and money received.

In the North-West Frontier Province, it is proposed that all funds collected and donations received should be used to supplement the bull subsidy scheme they have in force. No separate organisation has yet been provided.

It will be observed from the above that there is considerable variation in the organisations which are being set up in the different provinces to deal with the matter, but absolute uniformity cannot be expected and indeed is not advisable, providing the arrangements for the collection and distribution of funds are of a permanent character, and that both officials and non-officials interested in livestock improvement are represented on the board of control.

The establishment of such funds has been recommended primarily with the object of providing funds for the maintenance of pedigree or approved bulls, but it might also be used to provide some of the staff so urgently needed for recording the performances of the stock of these animals, so that demonstrations of the improvement effected may be arranged for display at agricultural exhibitions, cattle shows, etc. This involves the recording of the services of approved bulls, the registration of their progeny, the maintenance of provincial registers for approved animals, the opening of provincial herd books for specified breeds in selected areas, and milk recording when milk breeds are being dealt with. Of the above items, the first four will usually be performed by the person in charge of the bull and the executive staff of the department charged with livestock improvement, but in regard to milk recording in the villages, the Animal Husbandry Wing which met in Madras in December 1936 held that this could not be done without special staff. The importance of making a commencement in this direction in certain areas, however, is obvious and any funds that can be spared for the special subordinate staff required well.

SUBJECT No. 2.

The improvement of grass lands and the better utilisation of waste and surplus land for fodder production and the initial steps to be taken in that direction by the various appropriate agencies.

Note by Imperial Council of Agricultural Research.

This particular subject on the agenda bristles with administrative difficulties but the main lines to be followed in improving grass lands are fairly well-known.

The Royal Commission on Agriculture remarked "We are well aware of the difficulties likely to be met with in practice in getting owners of cattle to adopt more rational methods of utilising the diminishing grazing areas of India, but the poverty of so large a proportion of the breeding herds of the country is such a serious handicap to the improvement of agriculture, and the management of the available grazing lands is so bad, that a great effort to alter existing conditions is necessary, and is indeed long overdue".

In considering this question, it must be remembered that grazing lands in India are of two kinds, viz. :—those administered by the Forest Department and those under private ownership or included in the term "waste lands".

As regards British India, the Royal Commission pointed out that of the total area of land about 20 per cent. is administered by the Forest Department and 45 per cent. is classified as "cultivable waste" or "land not available for cultivation" and it made the recommendation that the classification of this large area representing 65 per cent. of the total area of British India should be re-examined with a view to providing better grazing facilities for India's livestock.

With reference to the area now administered by the Forest Department, the Commission stated "The ideal to be aimed at in all provinces is to distinguish between land which is suitable neither for timber, fuel plantations nor for ordinary cultivation, but may possess possibilities for development as fodder reserves and grazing grounds", while in regard to waste land it remarked "We think it likely that within these vast areas there could be found much land which, although unsuited for commercial afforestation, might be used to grow fuel and provide better grazing than it now does".

An important step to give effect to these recommendations of the Royal Commission was to hold, in connection with the last Animal Husbandry Wing meeting of the Board of Agriculture, a preliminary meeting of forest and other officers in Madras in December 1936 and a copy of the report of that Conference is attached to this note.

That report will no doubt be read with great interest by those studying this subject, but attention may be drawn to some of its salient features.

In the first place, it points out that of the four main groups into which reserved forest land is usually divided, only groups (c) and (d), viz. :—poor coppice, scrub or thorn forests, and true pastures are suitable for use to any extent for grazing. Several methods of improvement which have been introduced are referred to and other lines awaiting investigation are mentioned, such as the "safety incidence" of various types of grassland and the nutritive value of different grasses. The question of exercising control, whether by the levy of enhanced fees or otherwise, is also raised. It seems to be the intention of the Committee that the initiation of further measures of improvement should be left to the Forest Department, but it would appear desirable that the Standing Fodder and Grazing Committee, which is recommended for each province under Part II of the report, should be in a position to make recommendations and give advice in regard to the treatment of the areas classed as (c) and (d).

Attention is invited to the conclusions of the Committee on this part of the report, particularly to the statement that power to control both periods of closure and numbers utilising the grazing is absolutely essential to proper management and should be provided, if necessary, by legislation.

One striking point that emerges from this report is the fact that in the five provinces examined, *viz.* :—United Provinces, Madras, Punjab, Central Provinces and Bombay only 8½ million out of 97 millions of cattle are in a position to avail themselves of forest grazing, so that obviously the better utilisation of waste lands is a matter of more economic importance. Forest grazing lands, however, can make an important contribution to the subject as in them control can more easily and quickly be applied. Their value as demonstration areas is great. Cases in point are the greatly improved growth of grass in some of the Punjab hilly tracts, where bunding work to prevent soil erosion has been carried out, the reclamation work in the Jamna-Chambal ravines by the United Provinces Forest Department, the exact and continuous work in Bombay which includes both pasture improvement and land conservation, and the introduction into certain areas in Assam, where cattle are kept under ranching conditions, of better method for selecting their breeding bulls, castration of the surplus male animals, and vaccination against contagious disease.

As already observed, the Royal Commission on Agriculture recommended 10 years ago that systematic investigation of the possibilities of waste lands as producers of fodder and fuel should be undertaken, but it seems that, with a few notable exceptions, no effort in this direction has yet been made. Owing to the large increase in population that is taking place in India, with a consequent demand for more land for cultivation, this problem is now a very urgent one. The Conference of Forest Officers also emphasised this point and as an illustration of what might be done they quote the case of certain *Usar* lands in the United Provinces where, simply by closing the lands to grazing during the monsoon, the yield of hay has risen in 5 years from 2.75 maunds to 15 maunds per acre.

In order to implement the recommendations of the Royal Commission on a wide scale the Special Committee of Forest Officers recommended the setting up of a Fodder and Grazing Committee in each province. These recommendations were accepted by the Animal Husbandry Wing of the Board of Agriculture, with the modification that each Provincial Committee should include a botanist and an agriculturist, and also a veterinary officer if the animal husbandry officer did not possess veterinary qualifications. These Committees will undertake the re-classification of waste land outside Government forests and select areas fit for the production of fodder or for use as grazing grounds. They will also advise the local Governments as to the best agency for the management of such lands, and will, no doubt, indicate the lines along which investigations are needed and improvements in management are required, and it is proposed that their work should be co-ordinated by a Special Fodder and Grazing Committee of the Imperial Council of Agricultural Research.

As it is proposed that the latter Committee should meet at the next meeting of the Advisory Board of the Imperial Council of Agricultural Research in September 1937, it is desirable that the Provincial Committees should be set up without delay, so that their representatives at the central meeting will be in a position to describe the special problems in each province and arrive at general conclusions in regard to the main lines of improvement to be followed throughout India.

REPORT OF THE PRELIMINARY CONFERENCE ON THE BETTER UTILIZATION OF FOREST AREAS FOR GRAZING.

TERMS OF REFERENCE.

(i) To examine the existing methods of management of forest grazing areas with a view to ensure that they provide the best type of grazing and are used as far as possible for the preservation and improvement of the best type of cattle ; and

(ii) the possibilities of developing the utilization of ravine and other derelict land outside Government forests for grazing purposes in order to supplement the facilities for grazing provided in Government forests, and to make recommendations.

REPORT—PART I.

The preliminary conference convened for the consideration of item 34 of the Agenda—The Better Utilization of Forest Areas for Grazing—has had placed before it full reports from all Provinces and Presidencies. These reports have included detailed statistics of incidences of grazing on forest land, percentages of the total cattle and live-stock populations which utilize forest grazing, and percentages of forest land to total areas. These figures, though of the greatest interest, cover so wide a variety of conditions that it is not possible to compress them into a brief report. Selected figures also might give a false impression of the position as a whole. It has therefore been decided to deal with the subject on broad general lines for India as a whole.

2. Grasses resemble trees in constituting crops with a wide diversity of utility. But, considering their value as a cheap source of fodder it seems that grasses have been strangely neglected in the past, both as regards detailed scientific research into their individual nutritive properties and as regards investigations into the best methods of their treatment as crops. The layman is apt to consider all grasses as producing grazing, just in the same way as he tends to assume that all trees produce timber : in each case a uniform commodity provided by nature with no, or only trivial, assistance from man. All Forest Officers, as producers of timber, realize the deplorable fallacy in such ideas. Also as managers of land, Forest Officers have a considerable interest in the occurrence and utilization of grasses, though usually only as a side line to their main business. The natural occurrence of grasses as well as of trees is governed by a combination of the factors of topography, climate and soil. And in India, generally speaking, the grasses take an important place in the vegetation under conditions which normally inhibit the production of the best timber.

3. A rough, but convenient, general classification of the vegetation in areas which come under the management of the Forest Department in India distinguishes four main types :—

- (a) The coniferous forests of the Himalayas.
- (b) All other timber forests.
- (c) Poor pole, scrub or thorn forests.
- (d) True pastures.

Class (a) includes at lower levels the chir pine forests (*Pinus longifolia*). Here the undergrowth is typically grass which provides grazing of indifferent quality. Closures for reproduction of the pine crop are the only closures made. Over the rest of the area in the Punjab and Kumaon Himalaya unrestricted grazing under rights or concessions is permitted. Early burning is carried out for fire protection and nothing more can be done to improve the grazing. At

higher elevations the forests consist typically of *deodar* (*Cedrus deodara*) and the first beneath which the forest floor is usually bare of all plants suitable for grazing other than a few weeds during the rains.

4. In class (b) are placed other forests yielding timber, as visualised in Resolution no. 22-F. of 19th October 1894. It includes the great *sal* (*Shorea robusta*) belt of the foot-hills and parts of the Central Provinces, Orissa and Chota Nagpur, the better quality teak (*Tectona grandis*) forests of the Central Provinces, Bombay and Madras, and the tropical evergreen forests of southern and western India. In these areas grazing is usually of little value and where carried out under rights, is generally harmful. In the miscellaneous forests included in *sal* divisions, grazing is carried on under the prescriptions of the local forest working plans. These plans take into account all privileges and rights acknowledged under the Revenue settlements in force in the districts concerned. They are invariably scrutinized by the Revenue authorities before being sanctioned by Government. Subject to careful avoidance of any interference with the acknowledged rights and privileges, closures to grazing are usually applied solely with reference to the avoidance of physical injury to young tree crops after exploitation of mature timber. Owing to the fact that climatic conditions which are suitable for the growth of timber forests are seldom such that fodder grasses can take any place in the climatic climax vegetation, the grazing available is usually of the coarsest quality and in little demand.

5. Class (c).—*Poor Coppice, scrub or thorn forest* covers the great bulk of the remainder of the lands controlled by the Forest Department. In some provinces this class also extends over large acreages of private lands or lands classified as "cultivable waste" under the Revenue Department. In other provinces in accordance with the policy of the Government of India, which was introduced in their Resolution no. 17-A-105 of 15th July 1891 calling for tripartite classification of all land into :

- (1) Cultivation,
- (2) Pastures and Fodder Reserves,
- (3) Forests properly so called.

Much land was formally notified as Reserved Forest simply for administrative convenience in order that it might be brought under some organized management. The objective was specifically stated in the Resolution not necessarily to be the production of trees, and the agency for management was not necessarily to be the Forest Department. It was also clearly laid down that pastures meant grazing grounds which were to be brought under a definite system of management. Such land is usually in areas of light rainfall and carries a crop consisting principally of grasses and shrubs, interspersed more or less profusely with poor pole, scrub or thorn forest in accordance with local increase or decrease of soil moisture. A considerable percentage of it might therefore be designated as wooded pasture. Unfortunately, because of the light rainfall, this type of natural vegetation is highly vulnerable to ill-treatment and much more easily destroyed than vegetation with a heavier rainfall. It was therefore in greatest need of careful management. But the history of these lands has almost always been that, until recent years, not only have they received the least scientific management : they have also frequently been, in all senses of the phrase, a "no-man's land". In the Bombay Presidency in 1898 and again in 1910 large areas in the Deccan, totalling roughly 1,500,000 acres, were removed from the control of the Forest Department and placed under the Revenue Department who have neither the staff, the time, nor in the majority of cases the technical knowledge, to regulate the grazing utilization in any way. In the Madras Presidency in 1924 some 3,400 square miles of lands formerly managed by the Forest Department were transferred to control by village panchayats. In its latest review of the working of these forest panchayats in Madras Presidency the Board of Revenue has remarked

that, "Most of the Collectors report that the ordinary revenue staff has not been able to devote the requisite attention to the panchayats with the result that many of them are left to take care of themselves. The forests have in consequence deteriorated to some extent".

6. In areas in this class (c) which are still under organized management by the Forest Department grazing is regulated by the prescriptions of the local Forest Working Plans, and in the past these prescriptions were usually similar to those for timber forests. In recent years however, as these plans have come up for revision, the grass crops have received increasing consideration in conjunction with the tree crops, since the former frequently represent an important part of the climax vegetation under the climatic conditions in which these pole, scrub and thorn forests occur. In the Central Provinces every Working Plan includes an elaborate grazing settlement. When the Working Plan is completed as far as silviculture is concerned and approved by the Chief Conservator of Forests, Government appoints a Special Revenue Officer to examine and report on its effect on the local population, and a most important part of his work is the grazing settlement. This is put up in skeleton by the Working Plan Officer and he and the Special Revenue Officer work out the details on tour together. The forests are divided up into grazing units, which are geographical areas, fixed on the demand for grazing. Where demand is heavy units may be small, usually a few thousand acres, but perhaps as small as a few hundred. Where demand is light, units are large and may be several hundred square miles. Each unit is then examined in detail. The average area open to grazing is calculated by deducting the average area closed from the total area. From the incidence for the type which varies from 1 to 3 acres per head, the number of cattle admissible is then calculated. This is compared with demand as obtained from past figures and by enquiry direct from the villages concerned. When exclusions are necessary, cattle from villages at a distance or which graze only occasionally are first excluded; sometimes transfers can be made to other units almost as convenient but this requires careful arrangement. If the demand is still in excess of the number admissible exclusions are made by classes. Plough cattle up to four per plough are admitted first, under the head of privileged cattle. After that ordinary cattle (or milch cattle) are admitted up to four per plough. After that additional and commercial cattle can be admitted up to the limit. As an example in some units of Nimar division, four privileged cattle and two ordinary cattle are admitted per plough. Each unit is described and defined in the Working Plan and if grazing demand is fairly heavy the villages allowed to graze are listed to the unit. Such a system for the control and management of grazing areas is to be highly commended. In one division in the Madras Presidency (*viz.*, Nellore), an ancient system known as the Kancha system prevails. This division is noted for its superior class of cattle. Under the kancha system the grazing area is divided into convenient blocks which are leased. The lessee (the kanchadar) issues permits to the ryots at rates ranging from 4 annas to Rs. 1-8-0. He is bound by the terms of his agreement to protect the block, to close it to grazing for three months commencing with the monsoon, and to limit the admission of cattle to the possibility. This system has largely contributed to the preservation of the fine breed of cattle for which this division is famous. Elsewhere in India grazing in this type of forest is free by right and without any restriction in number, with the result that not only have the forests been ruined both for the production of wood and grass, but erosion has become a major problem.

In the United Provinces, in Bundelkand and Ajmer, a special point is made of closure to grazing during the four monsoon months and slow and steady improvement is reported as compared with neighbouring village waste which is open to uncontrolled grazing throughout the year. The Forest Working Plans for Saharanpur, Gonda and Banda divisions, prescribe up to two square

miles of new plantations to be made annually in which a mixture of timber species (chiefly *Dalbergia sissoo*, *Acacia catechu* and *Bombax malabaricum*) are raised with a varying proportion of fodder species for lopping (e.g., *Terminalias*, *Bauhinias*, *Kydia calycina*, etc.). These plantations are made in lines between temporary cultivation of field crops and after the cultivation is abandoned the subsequent grass crop is generally decidedly better than that formerly occupying the ground. Useless bushes and shrubs have also been eradicated by the cultivation.

In Bombay Presidency special rotations for the improvement of the grass crops have been introduced in East Khandesh district for all the areas of this class under the management of the Forest Department. Each compact area is divided into convenient blocks and each block is subdivided into five compartments each of which receives the same treatment on a five-year cycle. This treatment is as follows :—

Year.	Graze.	Close.
1 ..	15th June to 31st August, 2½ months	1st September to 14th June, 9½ months.
2 ..	1st November to 14th June, 7½ months	15th June to 31st October, 4½ months.
3 ..	1st September to 14th June, 9½ months	15th June to 31st August, 2½ months.
4 ..	15th June to 14th June, 12 months ..	....
5 ..	15th June to 14th June, 12 months ..	....

This sequence results in grazing being available in the following compartments of each block during each year of the cycle :—

Year.	15th June to 31st August.	1st September to 14th June.	1st November to 14th June.
1 .. ..	.. 1, 2, 3	2, 3, 4	2, 3, 4, 5
2 .. ..	.. 2, 3, 4	3, 4, 5	3, 4, 5, 1
3 .. ..	.. 3, 4, 5	4, 5, 1	4, 5, 1, 2
4 .. ..	.. 4, 5, 1	5, 1, 2	5, 1, 2, 3
5 .. ..	.. 5, 1, 2	1, 2, 3	1, 2, 3, 4

This cycle is superimposed on a 30-year felling cycle for coppice poles and fuel. The system has been in force for 5 years and has resulted in definite improvement in the quality and quantity of the grasses. A similar system with some slight modifications has now been proposed for introduction in the whole of the adjoining district of West Khandesh.

In the Punjab the Forest Department is powerless to introduce improvements owing to the fact that unrestricted free grazing has been given as a right. The foot-hills have in consequence been denuded of their vegetation and the consequent erosion of these tertiary rocks is appalling. The question of the ameliorative treatment of areas outside the control of the Forest Department is dealt with under Part II of our terms of reference. All that need be said here is that generally the high hopes as to the future of areas handed over for management by panchayats, advisory boards, and similar bodies do not appear to have been realized. Grasses emphatically form a very specialized type of crop and just as, for trees or field crops expert knowledge and skilled management are essential.

7. The last class of land class (d) consists of true grazing grounds where grass and not trees is the climax vegetation. So far as the Forest Department sphere of control is concerned these are limited to the Alpine pastures and the considerable areas in the Terai in the United Provinces and Assam. In neither case are any special steps considered to be necessary at present for the improvement of the grass stock. In the terai grazing improves the quality of the herbage which otherwise is excessively coarse. The Alpine pastures are too remote for any control to be feasible.

8. Figures put before us make very clear the fact that the grazing which can be made available in lands in charge of the Forest Department can exert only an almost trivial influence upon the vast problem of the improvement of India's livestock as a whole. Representatives from the United Provinces, Madras, Punjab, Central Provinces and Bombay have been present at this preliminary conference and the following summary taken from official figures gives the numbers of livestock which at present utilize forest grazing and their incidence per acre. For comparison with the above are given the total livestock populations in each of the above provinces and for the whole of India. These figures have been further analyzed so as to show the proportion of livestock which obtain grazing in forest lands, and their incidence per square mile. For comparison with the above the incidence is given of all the remaining cattle in each province on lands which may be considered as possibly available for grazing outside forest lands. These include all lands which are classified either as not available for cultivation, or as cultivable waste excluding fellow.

Forest Grazing Lands.

Province.	Total area of forest lands in square miles.	Area open to grazing in square miles.	Numbers of Livestock in thousands utilizing forest & grazing.				Total.	Numbers per square mile of open area and acreage available per head.	Acs.
			Buffaloes.	Cows and bullocks.	Sheep and goats.	Others.			
United Provinces	6,000	4,000	146	883	250	10	1,289	322	2
Madras ..	16,000	14,000	108	1,370	732	..	2,210	158	4
Punjab ..	5,200	4,700	247	866	1,557	56	2,726	580	1.1
Central Provinces	19,400	17,000	312	2,500	300	5	3,117	183	3.5
Bombay ..	14,000	12,400	353	1,514	542	17	2,426	195	3.25
Total ..	60,600	52,100	1,166	7,133	3,381	88	11,768	226	2.8

1935 Census Figures for total livestock populations in thousands.

United Provinces excluding Kumaon	9,293	23,177	10,002	818	43,290
Madras ..	6,817	17,790	18,700	203	43,510
Punjab ..	6,048	9,792	8,539	1,398	25,827
Central Provinces ..	2,194	11,650	2,193	185	16,222
Bombay ..	2,513	7,448	3,700	200	13,951
Totals ..	26,865	69,857	43,274	2,804	1,42,800
Rest of British India ..	4,768	42,147	15,111	539	62,565
Indian States 66 per cent. ..	12,351	42,022	33,752	1,790	89,915
Total All-India ..	43,894	1,54,026	92,137	5,133	2,95,280

4. Estimated areas available for grazing outside forest lands and numbers of livestock which are not in a position to take advantage of grazing in forest lands.

Province.				Livestock in millions.	Area available. (Square miles.)	Incidence per square mile.
United Provinces	..	..	..	42	31,000	1,335
Madras	..	..	..	41.3	51,000	801
Punjab	..	..	..	23	42,000	548
Central Provinces and Berar			..	13.1	30,000	437
Bombay	..	..	..	11.5	40,000	287

5. These figures show that the numbers of livestock which are in a position to take advantage of facilities for grazing in forest lands are only a very small fraction of the whole livestock population. The figures are for cattle alone :—

United Provinces	..	..	..	1	million out of 32½ millions.
Madras	..	..	..	1½	„ „ 24½ „
Punjab	..	..	..	1	„ „ 16 „
Central Provinces	..	..	..	3	„ „ 14 „
Bombay	..	..	..	2	„ „ 10 „

This gives for these 5 provinces, only 8½ million out of a total of 97 millions.

6. We are not in a position to state whether any, and if so, what proportion of this vast livestock population may be fairly considered as uneconomic. From such figures as are at our disposal the indications seem to be rather that distribution and quality rather than quantity are faulty, and that while there is probably a shortage of good working bullocks in the areas of intensive cultivation, there is certainly an excess of scrub animals in the areas where cultivation is least extensive and grazing lands are commonest. How far this can be correlated with the production of cultivated fodder crops we are also not in a position to give any definite opinion but figures have been quoted to us in the specific example of the Meerut and Muzaffarnagar districts in the United Provinces as compared with Jhansi district in the same province. It has been stated that cattle in the former districts appear to be superior to those in Jhansi. It is a fact that in Meerut and Muzaffarnagar there are some 200 to 250 acres of cultivated fodder crops and only 250 acres of grazing lands to every 1,000 head of cattle; whereas in Jhansi there are 750 to 1,000 acres of grazing lands and only 1 acre of cultivated fodder crops to every 1,000 head of cattle.

9. For forest lands in the five provinces represented at this Conference the incidence of grazing varies from 1.1 acre per head in the Punjab to 4 acres per head in Madras and averages 2.8 acres. But these lands include all the

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dense timber forests, in which there is very little real grazing available. Moreover the figures are "over-all" averages for very large areas, a quite high percentage of which are utterly remote from all cultivation and habitation. There can therefore be no question that the incidence on the fringes of forest lands, near villages, and also around sources of water-supply in the interior where temporary or semi-permanent camps may be set up, must be quite unreasonably high. Everyone who has made a study of grazing management has repeatedly emphasized the fact that, not only is improvement in the quality of the grasses impossible, but deterioration is practically inevitable unless the incidence of utilization can be controlled. Such control must include limitation of numbers as well as period of utilization. Closures in rotation will ameliorate the condition of the crop; but full control of the numbers admitted to graze is essential for real improvement. We have no exact information as to what may be the correct figures for numbers per acre. Obviously it must vary greatly in every locality, being dependent not only upon natural vegetation but also upon the result of past treatment. Nor have we any information as to the varying quality of forest grasses. From observation it appears likely that the relatively coarse grasses of the timber forests are probably poor in nutrients and useful only as roughage. The fine grasses of our (c) class pole, scrub or thorn forests are much better. There is a generally accepted empirical figure that about two acres per head of cattle is the minimum average which can be permitted with safety. But it is our opinion that both these questions of safety incidence, in various types of grass land and the nutritive qualities of different grasses are deserving of special research. Unfortunately up to now in all provinces except the Central Provinces, the safe incidence of utilization has been of purely academic interest. The charging of reasonable fees for grazing could be an indirect method of control. In the Punjab the vast majority and in the United Provinces some 68 per cent. of the animals utilizing grazing in forest lands are allowed to do so free, as an admitted right. In other provinces free grazing is frequently allowed in greater or lesser proportion as a privilege. But everywhere those animals which are required to pay fees are charged merely some token amount which bears no relation whatever to the economic value of the grazing at their disposal. These fees vary in amount but are usually between two and eight annas per annum for bulls, bullocks and cows and twelve annas to rupees two for buffaloes. Calves are usually allowed free. Sheep and goats in the Punjab pay three-fourths and two annas respectively per annum. These token payments also usually carry with them legal permission to graze over such extensive areas, for example, in Bombay Presidency roughly 3,000 square miles, that any control is automatically made impossible. Simultaneously the low rate charged actively tends to encourage the increase in numbers of useless animals. Yet even these trivial amounts are made the subject for agitation as is shown by numerous debates in Provincial Legislative Councils and also in the Council of State. The present position seems to us to be a typical example of a vicious circle. The Forest Department has demonstrated already, as is shown by the examples quoted in paragraph 6 above, that much improvement is possible, by proper management, both in the quality and quantity of the grazing available in forest lands of class (c) type. Without control of the animals utilizing the improved crops, however, all such improvements are inevitably quickly dissipated by excessive grazing. They merely serve, during their existence, to encourage the survival of still larger numbers of uneconomic scrub animals. A very low rate of uniform fee encourages this process even further. The trivial fee received and the feeling of wasted effort combine to discourage the continuation, and still more so the extension, of any improvements which will cost money. Whereupon the villagers, not unnaturally, complain that the Forest Department does nothing for the money it receives from them and therefore they agitate for free grazing.

10. Our terms of reference also require us to consider whether the existing methods of management of forest grazing areas ensure that these are used as far as possible for the preservation and improvement of the best type of cattle. At various times and places the possibilities of exclusion and admittance according to quality or type of animal have been considered. The conclusion has been that any such procedure involves such difficulties as to be impracticable. This is of course no reason why further efforts should not be made in this direction. Limitation by quality however presupposes limitation of numbers and the latter is necessarily antecedent to the former. Here again, therefore, the charging of reasonable fees might produce the desired result. We desire also to emphasize the point that grazing grounds upon which unlimited numbers of livestock can be maintained at no, or entirely trivial, cost inevitably become a factor encouraging the deterioration of livestock. There can equally be no question that these same grounds, with proper management, should, and could, be a valuable factor in the improvement of the cattle of India. We are advised that, especially for maintaining the quality of draught breeds of cattle, grazing is a most desirable supplement to stall feeding. Control, involving limitation of numbers as may be necessary, over the cattle utilizing the grazing in forest lands is a crucial necessity without which proper management is impossible. Limitation can be effected in two ways : directly by executive order or indirectly by economic pressure through fees. By the first method full control can be exercised and must vest in an expert in order to insure as far as possible that proper use is made of this power. The second method is indirect, uncertain and probably somewhat slow in taking effect, and may be open to political misinterpretation as an increase in taxation. Its exact financial effects are difficult to forecast, but would increase the revenue at present received in most provinces very considerably. The precise manner in which control should be provided is therefore a matter of policy which Government alone can decide.

11. Our considered conclusions are—

- (1) That there is scope for further improvement in the quality and quantity of grazing produced by forest lands of the type which at present carry principally poor pole scrub or thorn forest and for the improvement of the amenities of grazing by the provision of better water-supplies.
- (2) That such improvement can only be effected by the provision of scientific management by a competent staff.
- (3) That power to control both periods of closure and numbers utilizing the grazing is absolutely essential to proper management and must be provided, if necessary, by legislation.
- (4) That proper management must involve expenditure which will not be immediately remunerative, and from which even the ultimate returns will very probably be mostly indirect. The mode of provision of the necessary funds must be decided by Government. Such expenditure should not be imposed as a further burden upon the budgets of commercial or quasi-commercial departments.

PART II.

12. Turning now to the second of our terms of reference, *viz.*, "to examine the possibilities of developing the utilization of ravine and other derelict land outside Government forests for grazing purposes in order to supplement the facilities for grazing provided in Government forests, and to make recommendations" we would like to point out, at the very outset, that it is impossible "to

supplement the facilities " in Government forests for grazing for all the cattle in India. An overwhelming majority can never get near Government forests and even with the most intensive utilization of the land available, the total fodder-supply from grazing grounds in Government forests must always be far short of actual requirements.

13. Out of the 97 million cattle in the Punjab, United Provinces, Central Provinces, Bombay and Madras, only 8½ million can visit the forests ; and it is desirable that better arrangements should be made for the fodder requirements of the remainder. The desirability of investigating the possibilities of utilization, for the purpose of fodder production, of ravine and derelict lands outside the forest is clearly indicated. The Royal Commission on Agriculture pointed out that about 20 per cent. of the total area of British India is administered by the Forest Department and another 45 per cent. is classified as " cultivable waste or land not available for cultivation " ; and recommended that the classification should be re-examined with a view to providing better grazing facilities for India's livestock. The Commission stated, " The ideal to be aimed at in all provinces is to distinguish between land which is suitable for the growth of good timber trees or for fuel plantations, and land which is suitable neither for timber, fuel plantations nor for ordinary cultivation, but may possess possibilities for development as fodder reserves and grazing grounds." The Commission further recommended that after reclassification such areas should be administered by a special branch of the Forest Department as a demonstration of what can be done under scientific control. The report continues " Nor do we think it likely that it will ever receive the attention that should be given to it unless it is placed under the management of a division of the Forest Department directly responsible for its development ". With regard to the areas classed as " cultivable waste " and " land not available for cultivation," the Commission remarked, " We think it likely that within these vast areas there could be found much land which, although unsuited for commercial afforestation, might, if placed under the charge of a Minor Forest division, be used to grow fuel and provide better grazing than it now does ".

14. Our reply to the first of our terms of reference shows that such reclassification of areas now under the control of the Forest Department is unnecessary. This classification has already been done ; and at every revision of a working plan of any forest division (generally every ten years) a complete re-survey of the area is carried out ; the classification is brought up to date and the management is modified accordingly. The Central Provinces have elaborate grazing plans, evolved with the co-operation of the Revenue Department, which are incorporated in each working plan. In the United Provinces and in other provinces where conditions so necessitate, working plans make separate provision for grazing facilities in grazing working circles.

15. The reclassification of areas described as " cultivable waste and land not available for cultivation " (hereinafter referred to as waste land) lying outside Government forests is, on the other hand, extremely desirable and should be carried out as early as possible. It is likely that the existing classification will be found to be out of date considering the rapid strides that Agriculture and Forestry have made during the last few decades. We think it probable that a fair percentage of such waste lands (in whichever province they exist) can be improved in a vast majority of cases. The extent to which improvement is possible depends naturally on the conditions that obtain in different provinces. In some this waste is the property of the State, in others of private individuals. These lands are subject to various land-revenue systems and no generalization is possible. In this connexion we wish to draw attention to the results obtained in the United Provinces. In the United Provinces, protection from grazing during the rains (June to November) of *Usar* (alkaline lands) has resulted in increasing the crop of hay in spite of grazing having been permitted after the hay harvest. The following are the figures of an actual research experiment

and have been supplied to us by Mr. Smythies (for details reference may be made to the Appendix) :—

Year.	Hay. Maunds per acre.
1931	2.75
1932	3.00
1933	5.00
1934	9.75
1935	9.25
1936	15.00

These figures show an increase of 500 to 700 per cent. in 5½ years.

16. On the poorer quality of soils the Forest Department in the United Provinces have made some thousands of acres of fuel and fodder plantations in Saharanpur and Bahraich division by means of plantations with field crops at practically no cost. With controlled lopping and coppice it is hoped to obtain, according to Mr. Smythies' forecast, 600 tons of green leaf fodder and 1,500 tons of firewood per square mile of plantation per annum. The afforestation of ravine land in Ettawah district is another instance of the possibility of utilizing otherwise unproductive land. Here good management was able to improve the grass crop and stop erosion.

17. There are, we believe, possibilities of extending fodder plantations in co-operation with private owners where the waste land is owned by individuals or communities. The creation of such plantations and fodder reserves should cause a substantial reduction in the quantity of cowdung now used as fuel.

18. While convinced of the possibilities of improving waste lands, we are definitely of opinion that the reclassification of such waste lands (as visualized by the Royal Commission) cannot be left to any single department of a Provincial Government. We recommend in every province the formation of a permanent Standing Fodder and Grazing Committee composed of officers deputed for the purpose by the Forest and Revenue Departments and an Animal Husbandry Officer. This permanent Committee for each province should act as the Provincial Committee of a new Grazing Sub-Committee of the Imperial Council of Agricultural Research, which would then be in a position to co-ordinate the work for the whole of India. The problem is an all-India problem, but the detailed solutions must be provincial.

19. The Provincial Fodder and Grazing Committees should investigate the reclassification of waste land outside Government forests and select areas fit for the production of fodder or for management as grazing grounds and should make proposals for the control and management of such lands. Our recommendations can only apply to waste lands to which the Government right of management is clear and undisputed. We hope however that private owners may, in course of time, be induced to manage their wastes on scientific lines provided that some organization is brought into existence for their assistance.

20. We have considered the question of agency required for the management of areas selected for fodder and grazing purposes and we are of opinion that the Provincial Fodder and Grazing Committees would be best able to advise the Local Government what may be the most suitable agency for this purpose. In addition the Provincial Committees should draw up schemes for research on approved subjects for submission to the Imperial Council of Agricultural Research for grants in aid for these investigations.

21. In brief our conclusions and recommendations therefore are—

- (1) That there is great scope for the introduction of proper management in lands which up to the present time have been outside the orbit of the activities of any of the technical departments.

- (2) That the organization of such improvements should vest in special Standing Fodder and Grazing Committee to be formed in each province and that their activities should be co-ordinated by a new Fodder and Grazing Sub-Committee of the Imperial Council of Agricultural Research.

Chairman.

C. G. TREVOR, C.I.E., Inspector-General of Forests to the Government of India.

Members.

T. A. WHITEHEAD, I.F.S., Chief Conservator of Forests, Madras.
E. A. SMYTHIES, I.F.S., Conservator of Forests, United Provinces.
C. M. HARLOW, I.F.S., Conservator of Forests, Central Provinces.
E. A. GARLAND, I.F.S., Deputy Conservator of Forests, Bombay.
N. P. MOHAN, I.F.S., Deputy Conservator of Forests, the Punjab.
W. S. READ, Punjab Veterinary Service.
R. D. PAUL, Madras Civil Service.

APPENDIX.

Statistics of Makhdoompur Usar experiment, United Provinces.

1. This experiment (started July 1931 by the Forest Research Branch, United Provinces) of 32½ acres was started to test the possibilities of improving fodder supplies from usar plains (the area of which in the United Provinces is 8,000 square miles, far greater than the total area of Government forest). The control of the experiment is complete, and the data obtained are therefore reliable.

2. The lay-out is as follows:—

All plots and sub-plots.—Complete protection every monsoon June to November.

Plot 1-1—Grass cut every year in November, and then open to unrestricted grazing for six months.

Plot 1-2—Grass cut every year in November, and then protected from grazing.

Plots 2-1 and 2-2—One and a half years' complete rest. Thereafter treated as sub-plots 1-1 and 1-2 respectively.

Plot 4—Five and a half years' complete rest. Grass cut for first time in November 1936.

Year.	All figures in maunds of hay per acre.					Remarks.
	Sub-plot.	Sub-plot.	Sub-plot.	Sub-plot.	Plot.	
	1-1.	1-2.	2-1.	2-2.	4.	
1931	2.75	2.75	nil.	nil.	nil.	1. All hay is cut and dried for 10 day and then weighed in November each year.
1932	3.0	4.75	5.75	4.5	nil.	
1933	5.0	9.25	5.5	9.0	nil.	
1934	9.75	12.0	8.25	10.0	nil.	
1935	9.25	11.75	8.0	10.5	nil.	2. The monsoon of 1932, 1933 and 1935 were poor. The monsoon of 1936 was very strong.
1936	15.0	20.0	15.5	17.0	18.0	
Total to date	44.75	60.5	42.0	51.0	18.0	
936 green grass	18.0	28.0	18.0	22.0	23.0	

3. The tentative conclusions which the above figures indicate are—

- (i) That protection from grazing during the rains has a *remarkable progressive effect* on increasing grass production (all sub-plots).
- (ii) That opening to grazing (after hay-making) for six months each year does not check the increasing grass production, but slows it down (cf. sub-plots 1-1 and 2-1 with 1-2 and 2-2). (It should be realized however that cattle have removed a certain amount of stubble after hay-making in sub-plots 1-1 and 2-1.)
- (iii) That continued complete closure both to grass-cutting and grazing serves no purpose, and results in a waste of annual yield (cf. six-year total of plot 4 with other plots).
- (iv) That total monsoon rainfall is an important factor, good rains meaning good hay crop. (This was well-known years ago in the Afforestation division.)

Taking 2.75 maunds per acre as the initial yield of hay after one monsoon protection, the increase per acre per annum after 5½ years has been 600 to 700 per cent. in the sub-plots protected from grazing (1-2, 2-2 and 4) and over 500 per cent. in the sub-plots (1-1 and 2-1) with six months' grazing allowed (but the good monsoon of 1936 may possibly have swelled this remarkable result unduly). The experiment is continuing, and the Research Branch will publish results in due course.

SUBJECT No. 3.

The need for increased technical personnel required for livestock improvement work through India.

Note by Imperial Council of Agricultural Research.

"India having acquired so large a cattle population and the size of the animals in many tracts having fallen so low, the task of reversing the process of deterioration and of improving the livestock of the country is now a gigantic one; but on improvement in its cattle depends to a degree that is little understood the prosperity of its agriculture and the task must be faced. Unless substantial changes in the existing management of cattle are introduced, a progressive deterioration in the quality of the cattle is to be feared."

The above quotation from the report of the Royal Commission on Agriculture, 1927, is taken as the text of this note, for it sums up so admirably the position of cattle in India as it was in 1927, and as it still largely is at the present time, in spite of much effort that has been expended on the subject in the last 10 years.

The stimulus that has recently been given to cattle breeding has brought the importance of this subject vividly before the public, but there is still a long way to go before it will be possible to say that the management of cattle and livestock in the villages of this country has reached the stage when their further deterioration has been arrested: much less that their improvement on a large scale has been commenced.

To carry out this rather ambitious programme, which, as the Royal Commission quite rightly says, is a task that must be faced, it is desirable that Governments themselves should take the lead and provide an organisation composed of suitably trained personnel, who will investigate the fundamental aspects of the subject at research Institutes and experimental farms in the first place and later carry their results into the villages where they can be given practical effect.

The first part of this programme has now been to a great extent provided. The Government of India have recently re-organised the Imperial Veterinary Research Institute, Muktesar, which deals with the pathological problems arising in the livestock industry, including the question of the control of contagious diseases, an enlarged Animal Nutrition Institute for the investigation of fundamental problems connected with the feeding of livestock is in process of being built, and an enquiry has recently been made into the requirements of the Dairy industry, and financial provision has already been made for an expansion of the activities of the Central Dairy Institute.

In the provinces investigational work on fodder is being undertaken at several centres, and in all provinces and several States, cattle breeding farms are now maintained and the breeding of pedigree stock of practically all our recognised draught and milch breeds is carried on with a view to providing approved animals to those who require them for stud purposes.

The personnel required for such research Institutes and laboratories as those referred to above is comparatively easy to obtain, for the duties of each post fall within fairly narrow limits and the actual number to be filled is not large, but the staffing of cattle farms requires rather more consideration, for here aptitude for the work and technical training have both to be considered. In this connection attention may be drawn to the recommendation of the Royal Commission on Agriculture on this subject which was "We favour the appointment of Veterinary Officers who display a special bent or aptitude for stock improvement to posts at livestock farms. We think it likely that graduates of Indian Veterinary Colleges would often prove useful recruits to the staff of such farms".

The curriculum of provincial Veterinary Colleges has been under review on several occasions recently, and recommendations have been made by the Imperial Council of Agricultural Research which, if adopted, should ensure that the Veterinary Assistant Surgeon of the future is even more useful in livestock improvement work than he was when the Royal Commission made the above remarks. In addition, the Government of India are considering a scheme which has been put forward for the training in this country of higher grade Veterinary graduates, whose curriculum will include all those subjects required by the complete animal husbandman.

It is when we turn to the question of technical personnel for extension work in the villages that most difficulties arise, for here the field, in regard to both the quantity and quality of the work to be performed, is almost unlimited and in these days of financial stress it is obviously not practicable to suggest for this work the introduction of a large body of highly paid men trained solely in livestock improvement work.

This question has, however, been under the consideration of several different bodies during the past few years and some definite recommendations have been made, but before enumerating these, it will be advisable to draw attention to the note, which is appended below, by Colonel Olver, Animal Husbandry Expert of the Council, which gives a comprehensive survey of the whole question of livestock improvement and shows very clearly what must be done in India if cattle management is to reach the high standard we desire and the people of the country are to obtain the maximum amount of benefit obtainable from their livestock.

This note emphasises in particular the necessity for the employment of officers at the head of affairs, who are experts in the subject and devoted to the requirements of the livestock industry in this country, and the recommendation of the Royal Commission on Agriculture on this point may also be quoted. They say "In view of the great importance of the (livestock improvement) work we are of opinion that at least one whole-time officer should be employed on it in each province. Where the improvement of several distinct types of cattle is

being attempted, carefully trained experts should be placed in charge of each section of the work".

The second part of the recommendation is of particular interest at the present time, when so much attention is being paid to the question of improving the milk supply of the country, and, no doubt, some provinces will consider the advisability of making special provision for this part of the subject.

One more point on which emphasis may be laid is the necessity, when selecting livestock officers, to remember that any amount of technical training will not necessarily make a man a good judge of animals. What is required in these officers, in common parlance, is a good "eye" for an animal and this is usually born in a man or it may be developed as a result of constant association with animals from youth upwards.

The staff which these livestock officers are to be given for extension of controlled breeding work in the villages is a matter of great importance and on the adequacy of this largely rests the success of the operations. In some provinces the executive staff of the Agriculture Department and in others of the Veterinary Department is used for livestock improvement work, but it is to be feared that in at least some cases this is looked on somewhat as a side-line and is apt to be over-shadowed by other duties. Obviously, as a matter of economy, as much use as possible should be made of suitable existing staffs, but the employment of the subordinate staff of the Veterinary Department on this type of work will be greatly hampered in some provinces while the existing arrangement, under which many of the staff are lent as whole-time servants to local bodies, remains.

In local agricultural, veterinary and forest colleges, much might be done to give the training imparted to the students a bias in the direction of livestock improvement, which should provide each province with a number of scientifically trained men interested in the extension of the work, who would make useful assistants to the livestock officers in those provinces in which the routine staff of the department in charge of livestock improvement requires more expert assistance, either for ordinary supervising duties or for particular types of work.

To turn to some specific recommendations, the Advisory Board of the Imperial Council of Agricultural Research, when considering the cattle improvement scheme initiated by His Excellency the Viceroy, recommended that for every 50 approved bulls at stud one suitably qualified inspector and subordinate staff should be provided, and it also recommended that, in order that the scheme may result in lasting benefit to the country, the following items of work should receive particular attention :—

- (a) The registration of the accredited progeny of approved bulls ;
- (b) The maintenance of the bulls through a fund to be established in each province ;
- (c) The formation of cattle breeding Societies, holding of cattle shows and award of sanads ;
- (d) The castration of all inferior stock ;
- (e) The permanent protection against Rinderpest of all registered stock free of cost.

Another important recommendation, which, if adopted, will provide a cheap agency for village extension work, was that made by the Animal Husbandry Wing of the Board of Agriculture which met in Madras in December 1936. This meeting has recommended the recruitment from amongst the ryot classes of youths interested in livestock and after a short period of training to be employed

as Stockmen on a suggested pay of Rs. 25—~~1~~—35 per mensem, on the following duties :—

- (1) Dressing and compounding,
- (2) Castration,
- (3) Treatment of simple and minor ailments,
- (4) Rendering assistance in vaccination and inoculation work,
- (5) Registration of accredited stock, including tattooing and branding of animals,
- (6) Collection of specimens and demonstrations in field work connected with special investigations,
- (7) Work in connection with dipping operations,
- (8) Propaganda work in connection with general sanitary conditions, flaying of carcasses, etc.,
- (9) Generally to advise village folk on the care and management of animals.

If the last item is taken to include some instruction in the better feeding of cattle and the production of clean milk, such a body of men should do much, at a comparatively low cost, to augment the efforts of the more highly trained personnel, which has been discussed above, to produce the improvement desired in the livestock industry of the country.

**Livestock improvement in India by Colonel A. Olver, C.B., C.M.G., F.R.C.V.S.,
Animal Husbandry Expert, Imperial Council of Agricultural Research.**

Since His Excellency the Marquis of Linlithgow became Viceroy of India, there has been a great awakening of interest in the improvement of livestock and of cattle in particular. The matter has been repeatedly discussed with provincial representatives, and this note is intended to put together in comprehensive form recommendations and conclusions as to the lines along which it seems that the development of livestock and livestock industry should proceed in India.

General Conditions.—From the discussions which have taken place it is evidently agreed that as far as cattle are concerned, the only sound policy for the plains of India is to improve the best indigenous breeds, by systematic selection and proper feeding and management, since European breeds have proved generally unable, even under the best conditions, to maintain themselves satisfactorily within the tropics. This general principle has been found to apply in the case of milch goats also, but in the case of poultry imported European breeds thrive well and seem on the whole to be less susceptible to disease than the ordinary village fowl. In the case of sheep, it has generally been found difficult to maintain European breeds in the plains, though some success has been obtained in establishing cross bred merino sheep for the production of better wool. In horses, the improvement effected by imported stock has been very great, though the expense of rearing high grade stock is generally beyond the means of the ordinary breeder. In the case of donkeys, the imported jack has done much to improve village stock.

Improvement of Cattle.—It is now abundantly clear that the efforts which were made in the past to improve cattle by breeding limited numbers on provincial farms has, in most provinces had little lasting effect on the bulk of the relatively enormous numbers to be dealt with. The reasons for this are not difficult to understand for it is obvious that the numbers of suitable sires which could be produced, on ordinary Government farms of limited extent, could never

be sufficient directly to affect more than an almost infinitesimal proportion of the huge numbers which exist. Moreover, fatal changes of policy, or change of control or for financial or other reasons, have intervened to dash any hope of achieving the extensive results which might have been obtained by skilful handling, on a definite programme, of such limited numbers of sires as were generally available.

On the other hand, in provinces where systematic measures for the improvement of livestock have been carried on generation after generation by animal husbandry organisations, such as the Veterinary Department of the Punjab, and to a limited extent the livestock sections of certain provinces and States, steady improvement has been effected corresponding with the extent to which the Department concerned has been expert in animal husbandry work and devoted to the care and development of livestock.

Furthermore, where due attention has been paid to purity of blood the improvement has been maintained and an interest in pedigree stock aroused, which augurs well for the future; provided that adequate measures are taken to maintain proper pedigree registration.

In view, however, of the steady reduction which is taking place in grazing areas, and the circumstances in which breeding is generally carried on in India, it seems clear that degeneration of stock is likely to continue unless more adequate steps are taken and a larger proportion of funds are allotted for their better care and development. At present, for the whole of India, including the Punjab, the total allotment for Animal husbandry, including Veterinary work of all kinds, is only about half of the total allotted for plant husbandry, and it seems clear that the first essential for the systematic improvement of livestock in India is an adequate Animal husbandry organisation, in each province or State, with no other interests to consider than the welfare and economic exploitation of stock, and with a more adequate share of the total amount of money allocated for the development of agriculture as a whole. Indeed it does not seem reasonable to expect adequate or lasting results in the improvement of livestock or in the profitable development of Animal industry unless and until such organisations are everywhere available.

The constitution and control of such organisations, and the powers and funds to be placed at their disposal, are thus matters of vital importance which need to be very carefully considered by provinces and States. It is not merely a question of veterinary or agricultural control, but it seems obvious that to develop livestock properly such departments should be under the control of suitably trained specialists in such work, devoted solely to the interests of livestock.

Selection of Breed and Type.—Given a suitable Animal husbandry department, the first thing to be done is to consider what kind of stock is to be raised, and it is essential at the outset to arrive at sound decisions as to the particular breeds and types which are likely to suit the circumstances and localities in which breeding is to be carried on. At the risk of stating the obvious, it must be pointed out that nowhere in the world is it sound policy to attempt to produce a type of stock which is not naturally suited to the local conditions of soil, climate and environment. That high class stock can be produced in areas which are not naturally suitable for them, there is no question, but the cost of doing so is prohibitive for the ordinary breeder and, apart from the constant struggle against adverse circumstances which would be entailed, there is the difficulty that—if of a breed or type different from the local stock—the male progeny, when used as sires, would be likely to do more harm than good. Moreover, in order to obtain fresh blood and to maintain type in the parent herd, it would be necessary constantly to import sires from elsewhere.

Type.—The decision as to the particular type to be bred, *e.g.*, working type or milch type, is another matter which requires very careful consideration since, in all breeding work, strict breeding to a type and unbroken continuity of policy, are all-important. In this connection, the question whether it is feasible to produce cattle which will breed true for a combination—in high degree—of working capacity, with a capacity for milk production, is one of the matters which has to be considered. This question has already been discussed at length in my note, "The Inadequacy of Dual Purpose Cattle as the Goal in Cattle Breeding in India", the point of which appears to have been missed by many. In that note it was not intended to deny that it is possible for an expert breeder to achieve duality of purpose—up to a certain point—provided that he is at liberty to select freely and to discard animals which do not show the desired combination of factors. But it seems obvious that the Indian peasant, who is not in any way an expert breeder of pedigree stock, and who maintains usually not more than one or two cows in a village herd, to meet his own requirements, cannot hope to be in this position. He is not permitted by his religion to slaughter cattle and can only hope at best to be able to mate his cow with a sire of the type he wishes to emphasize in the progeny. If he wants more milk, he would like to be able to mate his cow to a milking-type bull, and would have a much better chance of getting a high yielding heifer than if only dual purpose sires were available. If he requires more powerful work cattle, he would naturally prefer a sire of a pure working type. Ordinary commercial stock are commonly bred on these lines even in advanced countries, but it is a truism that to make and maintain progress, the breeder of pedigree stock must specialise all the time on one particular type.

For dairying in particular it is necessary to specialise, since if the milk producer is to have a fair chance of making a financial success of his business, he must have high grade milch cattle, and for that reason, in areas where dairy stock are largely bred, it is essential to develop high milking strains. Where the sale of bullocks is the traditional policy, breeding specially for work is likely still to be carried on by semi-nomadic professional breeders so long as suitable grazing remains available at low cost.

Between these extremes lie the great majority of cultivators who keep one or two cows and produce less specialised "general utility" stock which, though useful for their requirements cannot, in view of their heterogeneous origin, be relied upon to breed true and therefore cannot be described as "dual purpose" stock in its strict sense. To develop and maintain Indian village cattle as true breeding dual purpose stock would moreover be a colossal undertaking.

Furthermore, though much is said of the breeding of dual purpose cattle in this country, the method usually adopted appears to be to pay strict attention to milk recording and to retain the best milking strains until such time as definite signs of unsuitability for draught purposes appear in the progeny. When that time comes the breeder will be faced with a decision whether to retain any high yielding milk strains thus evolved, or to destroy the advance thus achieved by crossing back to a working type bull. What the answer must be in the interest of progress is not difficult to foresee and in the meantime, more milk is being bred into the stock. Along these lines so long as promising dairy strains are not crossed back to a work type bull there need be no objection to so-called dual purpose breeding but high capacity for work and for milk production are physiologically incompatible, and instances are not wanting in India where attempts to retain these factors, in equal degree, in one and the same strain, have led to marked deterioration of previously valuable stock. For beyond a certain point any marked advance in either direction must be cancelled out and the work must to that extent become Sisyphean while any progress towards fixation of a type which should breed true for either factor in high degree, must constantly be vitiated.

Even the combination of milking capacity with meat production, qualities which are not so incompatible as are capacity for work and milk production, has been given up in other countries, and it seems certain that a similar policy must eventually fail in India since it will not produce that definite segregation of types which has been found essential in every progressive country in the world.

The choice as to which type of bull to use must however largely be influenced by local consideration and the aim of governments should be to provide the type most needed in the locality or, where possible and advisable, to make milking type as well as working type bulls available. Where the supply of liquid milk is a profitable undertaking and where there are good facilities for the production of fodder crops, the choice would obviously fall on the dairy type, but the ordinary cultivator should as far as possible be in a position to choose the type of sire he considers the most suitable for his particular cows and for his requirements.

Cow or She Buffalo.—Similarly, a choice has to be made as to whether cows or she buffaloes are to be maintained. Here again there is some diversity of opinion and the choice is likely ultimately to be governed by financial considerations; though there is another aspect to be considered. Where abundance of coarse fodder is available, and where the production of ghee is a major consideration, or where liquid milk is produced for sale—usually by unscrupulous and uncontrolled hawkers—the she buffalo is at present commonly preferred. But investigation has shown that pure-bred cows of certain Indian breeds of cattle can, in a comparatively few years, be improved by proper feeding and management to a point where they can compete successfully with the buffalo in economy of milk or butter-fat production. In view therefore of the greater general utility of cows, as compared with buffaloes, in that they produce better working animals as well as milk, and of the important fact that cows' milk is a much better food, particularly for children, than buffaloes' milk watered down to the same level of butter fat, the question whether cows should not be bred and as well fed and maintained as are she-buffaloes is one which merits careful study.

The Breeding of Working-Type Cattle.—In areas where the demand for milk and dairy products is limited and where facilities exist for raising cattle on extensive grazing, the breeding of working-type animals is the traditional policy and seems likely to continue because it is difficult to carry on dairying under the semi-nomadic conditions of life of such breeders. But it is perhaps not sufficiently known that even among breeders of working bullocks a great deal of their total income is derived from the sale of ghee; e.g., we have recently been shown, by representatives of large numbers of professional cattle dealers and breeders in Western India, some of whom themselves breed and rear large numbers of working bullocks, that the income derived from their sale is not much more than one-fourth of that derived from the sale of ghee and other dairy products. The position is somewhat similar in other parts of India and owing to the growing realisation of the essential importance of milk in human diet, it seems likely that the market for liquid milk will improve, while already in certain large areas, milk collection for ghee or cream production is being organised on a big scale through the use of small cream separators. Thus, milk seems likely to become more and more an important consideration for the breeder of work cattle.

Capabilities of Indigenous Breeds as milch cattle.—A careful analysis of available records has shown that in different parts of India there are breeds, of pure Indian cattle, which respond readily to proper treatment and which possess considerable potentialities for milk production. But to ensure rapid progress it is obvious that milking strains must systematically be segregated out from the ordinary cattle of the country and mated with bulls of known pedigree from cows of high milk yields. In this way, in course of time, definite milking type Indian cattle should become available which could be relied

upon to breed true for milk and in view of the great need for such cattle, the Imperial Council of Agricultural Research is now engaged in instituting official herd books for seven of the best known milch breeds of India.

Cross-bred Indo-European Cattle.—For years past it has been demonstrated by organisations such as the Military Dairy Farms that cross-bred cattle from Indian cows by sires of European blood, in spite of the heavy capital and recurring expenditure involved, are generally under their special conditions of management, more profitable dairy animals than ordinary Indian cows. On the other hand, there is ample evidence to show that where control is inadequate or inexpert, the pursuit of such a policy leads to immediate loss of type, rapid degeneration and high susceptibility to disease.

But a policy of cross-breeding with European cattle is not in any case within the reach of the ordinary Indian milk producer, who is not at liberty to discard freely animals which do not reach the required standard. Moreover, since a long time is required to see the results of a policy and there is a natural tendency of individual breeders to repeat breeding experiments—in spite of previous failures of which they may not be aware—it is necessary to emphasise as strongly as possible that systematic improvement of the best indigenous breeds of Indian cattle is the only practicable policy for the generality of the people.

Breeding under Government control.—It seems generally agreed also that in India it is essential to make provision for organised breeding control in the villages, and that in all breeding under Government control a definite long range policy for improving local breeds should be laid down and suitable provision made to ensure that it shall not be changed, except after full consideration of all the issues involved.

Such a matter, in which irreparable harm may easily be done, should not in short be left to the personal predilection of a director who, in present circumstances, may not be a specialist in any branch of animal husbandry or devoted solely to the interests of livestock. Moreover, seeing that it is an impossibility to produce on Government farms the very large numbers of pedigree bulls which are required for mass improvement of cattle, it seems that the ordinary provincial cattle farm of limited extent should as a rule be utilised primarily for preserving outstanding strains of the best indigenous breeds and for the systematic development and recording of pedigree milch animals rather than in attempting to produce dual purpose stock.

It is agreed that for the improvement of the generality of stock of a province or state reliance must be placed upon systematic breeding control in the villages, at first concentrated in areas where the best cattle exist, and later extended, as circumstances permit, into less forward areas. As time goes on and a type becomes established, good animals from selected stock should be registered as pure-bred, while all inferior males should be castrated and the services of approved bulls recorded. In the case of dairy cattle, strict recording of milk yields is necessary wherever possible in order that, in course of time, breeders wishing to purchase high-grade dairy stock may be able to obtain reasonably accurate data as to the performance of their ancestors. Indeed, the lack of bulls of known pedigree has been one of the greatest difficulties encountered in carrying out the campaign of livestock improvement instituted by the present Viceroy.

Inoculation and Castration.—Simultaneously with and complementary to selected breeding along the above lines it is essential to make arrangements for protective inoculation against contagious disease; while the systematic castration of inferior males, before they can perpetuate the species, is obviously one of the most potent factors in any programme of livestock improvement. It is in fact now generally recommended that provincial or state legislation should be undertaken for compulsory castration in selected areas.

At the second meeting of the Animal Husbandry Wing of the Board of Agriculture, held in December 1936, this matter was discussed and it was decided to recommend that such legislation should be of a permissive nature and confined at first to small selective areas which could gradually be extended. But it was felt that the greatest tact would in any case be needed in the administration of such an act.

Grazing control and Fodder Production and Conservation.—In present circumstances the main factor in the production of moderate priced work cattle is the availability of suitable grazing, since fodder crops are seldom specially grown for such stock. Experience has, however, shown that to rear and maintain the more valuable grades of stock, whether for work or milk production, it is necessary to make provision for an adequate supply of fodder crops or other highly nutritious cattle food; depending on whether the young stock are sold at an early age, to be reared by cultivators under semi-stall-fed conditions, or are reared by the dealer with his nomadic herd. In either case it is necessary that some succulent food of suitable composition shall be available throughout the year, particularly for young stock, but also for breeding females.

The best means of providing such a diet is a matter for local study, but when the revenue obtainable from forests is compared with that from high grade stock, reared at least partly on cultivated fodder or semi-fodder crops, specially grown to supplement or replace the available grazing, it seems clear that it will pay provincial and state governments to give every facility for the production of such crops in areas which are at present under forest of low value.

To deal with this question adequately it seems essential that special committees should be formed as soon as possible on the lines which were recommended by the Animal Husbandry Wing of the Board of Agriculture at its second meeting, held in Madras in December 1936, after discussing the Report of the Special Forest Grazing Committee, which met during the previous week.

Such Committee should obviously be thoroughly representative of all livestock interests as well as the interests of forestry and crop production, and it on a permanent basis should be able to develop a co-ordinated long range policy in such matters as the control of forest and other grazing; the devotion of more land to fodder and semi-crop production; the conservation of grass and other fodder as hay or silage, and to advise as to possible measures to restrict the numbers of uneconomic cattle which at present overcrowd the available grazing, and are an ever-present source of infection.

Disease Control, Feeding and Management.—It must never be overlooked that correct feeding and proper management are most important in securing further improvement of stock. But it is now very clear from the work of veterinary investigation officers that expert investigation will constantly be needed in the myriad problems of disease, ill-health and unsatisfactory development due to faulty nutrition; the proper study of which entails continual attention and animal nutrition investigation and research carried out in collaboration.

At present breeders suffer even more from insidious loss due to nutritional deficiencies than from outbreaks of the major plagues of stock for some of the most important of which improved and cheap methods of control have recently become available. It seems clear, therefore, that in a country like India where a stamping out policy is impracticable and there is constant danger of infection, adequate staff should be provided for the continuous investigation of such problems all over the country, in collaboration with veterinary and animal nutrition research workers. This would be in addition to the necessary provincial veterinary staff which is required for the prompt control of epizootics and the treatment of sick cattle as well as for the carrying out of systematic preventive inoculation and castration and the management of fairs, abattoirs and dairies.

Marketing.—Marketing is another general factor which has immense potentialities in the improvement of livestock.

Indeed, it is obvious that unless and until satisfactory markets are provided, for improved livestock and livestock products, few stock-owners can afford to spend money on the improvement of stock. On the other hand, there is ample evidence that the establishment of a satisfactory market, *e.g.*, for milk or eggs, in any locality, immediately gives a great impetus to the better care and development of the class or stock concerned.

More detailed conclusions of certain Livestock Committees which have been formed from time to time to consider measures for the improvement of livestock are given in the Appendix.

General Conclusions.—Thus it seems clear that more adequate provision is necessary, in most provinces and States, for the systematic development of Livestock and Animal Industry.

Moreover, it is generally agreed by all authorities on human diet that a more adequate and better supply of milk is an outstanding need of India today—better not only as regards cleanliness, but also in its content of protein and mineral salts which are now recognised to be of first rate dietetic importance; particularly for growing children and in a diet which is otherwise mainly vegetarian.

It has in fact recently been shown, by practical feeding tests in India and in all progressive countries, that nothing can replace the protein, of high biological value, and the mineral salts which are contained in undiluted milk.

To ensure a better supply of milk it is necessary however (1) to provide for proper control of the marketing of this vital commodity—which at present is usually sold by insanitary, unscrupulous and inadequately controlled hawkers—, (2) to produce better milch animals, (3) to furnish better facilities to enable the milk required for cities to be produced in suitable areas outside city limits, and brought in for sale under satisfactory sanitary conditions, and (4) to make better provision for milk produced in the villages throughout the country, to be collected at suitable centres, and, after suitable processing, to be marketed as such or in the form of Ghee cream, (5) to make use of skimmed milk to the fullest possible extent, in human diet and particularly in the feeding of growing children, since in it is contained the whole of the most valuable dietetic constituents of milk, *viz.*, the body-building proteins and mineral salts.

At present, in many parts of India, the she-buffalo is for a variety of reasons preferred to the cow as a milch animal, but it would not be practicable in any event to provide from buffaloes alone, the greatly increased supply of milk which is needed. Moreover, there are points of considerable dietetic importance in this connection which should not be overlooked, *viz.*, owing to its very high though variable butter fat content, undiluted buffaloes milk is not usually suitable for human consumption. To make it suitable it needs to have 50 per cent. or more of the cream removed and, since undiluted cows and buffaloes milk have about the same percentage of protein and mineral salts, if both are watered down to a suitable level of butter fat (say 3.5 per cent.), buffaloes milk becomes of much less feeding value, particularly for growing children, because the protein and salts thereby become much more heavily diluted.

Thus, while nothing must be done to interfere with the production of useful work cattle, it appears that the production of more and better milch cattle is a matter of great importance and urgency for the welfare of the people of India.

But to make satisfactory progress and provide really efficient milkers, it will be necessary to concentrate on high milk production in particular strains regardless of what the effect may eventually be on the capacity for work of the bullocks bred from these particular strains.

The existing supply of working type cattle should in fact be more than ample if young stock and breeding females were better fed, but there is a great shortage of efficient milch cows all over India. On the other hand, it is now well known that there are pure Indian breeds of cattle which have good latent capacity for milk production and which respond readily and markedly to better feeding and management—much more so than buffaloes.

It seems clear, therefore, that the systematic development of high yielding milch strains of suitable Indian breeds of cattle, as well as of buffaloes for ghee production, is a matter of great urgency and importance to India.

Owing to the high biological value of eggs in human diet, the development of poultry by systematic encouragement of pedigree breeding of selected European breeds, is another matter of great dietetic and economic importance to which far more attention needs to be given as a cottage industry.

APPENDIX.

The question of livestock improvement, with special reference to the pedigree bull scheme initiated by H. E. the Viceroy, was discussed in detail first by the Standing Cattle Breeding Committee of the Advisory Board of the Imperial Council of Agricultural Research held at Simla in July 1936 and then by the Livestock Improvement Committee of the Second Animal Husbandry Wing meeting of the Board of Agriculture and Animal Husbandry, held at Madras in December 1936. The following are the conclusions and recommendations arrived at by these committees :—

1. In order to effect cattle improvement on a broad scale it is necessary greatly to extend controlled breeding in areas where definite types exist and that subsequently as large numbers as possible of selected bulls from these areas should be employed in areas where at present there is no definite type.
2. Where the cattle of an area are sufficiently pure the recording of approved stock in official herd-books should be taken up provincially. Such recording would be quite distinct from the official registration of pedigree stock of dairy breeds of all-India importance which is now being taken up by the Imperial Council of Agricultural Research.
3. In order to ensure a continuous supply of pedigree or approved bulls it is necessary to establish pedigree breeding in selected areas.
4. In order to carry on continuous improvement it is necessary to record accurately the services of all approved bulls and to register their accredited progeny. For this purpose it is necessary to employ extra staff at the rate of one suitably qualified inspector and subordinate staff per 50 bulls.
5. It is not possible at present to carry out strict registration of pedigree stock under village conditions of breeding, nor to undertake milk recording in villages without special staff.
6. It is felt that a great deal of good could be done if the herds maintained in jails, mental hospitals, etc., at Government expense, and at Pinjrapoles were more extensively utilised for the breeding of pedigree stock, and at such institutions strict milk recording should be feasible. It was also suggested that inducement might be given to the Military Dairy Farms to rear the best of their young male stock of indigenous breeds and to suit their breeding policy as far as practicable to the accepted policy of the country, i.e., the improvement of indigenous breeds. It was also suggested that small herds of pure-bred indigenous dairy cattle should be maintained at Government Seed and Demonstration Farms.
7. For the maintenance of bulls it is necessary to establish funds the proceeds of which should be spent partly for the purpose of bulls and partly for their maintenance.

8. Wherever bulls are provided by Provincial or District Cattle Breeding Associations it is essential that provision be made from the same source for their maintenance. Otherwise it may not be possible to accept them.

9. Arrangements should be made for the castration of inferior stock in areas where approved bulls are at work. In regard to compulsory castration it was decided that an enabling Act would be an advantage in most provinces and States, but that it would be very necessary to exercise tact in its application. It could only be applied where the great majority of breeders were agreeable and where arrangements could be made to supply an adequate number of suitable bulls to serve the cows in the area concerned.

10. Interest of the ryot in cattle improvement should be aroused by such measures as periodical cattle shows and the award of prizes and *sanads* to those who had taken special interest in cattle breeding. Provincial or State Cattle Breeding Societies would also help to arouse interest in cattle improvement but it was considered that such societies need be formed only where satisfactory breeding control does not already exist.

11. In order to encourage people to take interest in pedigree stock it is advisable to give permanent protection against Rinderpest to all registered stock free of cost.

12. For the present, services of approved bulls should, as a rule, be given free of cost, but in certain provinces the system of charging fees should be developed.

SUBJECT No. 4.

The possibility of crop planning for increased fodder production with special reference to leguminous fodders.

Note by Imperial Council of Agricultural Research.

It is well known that over the greater part of India cattle are maintained mainly on fodders produced in the villages and not on grass, which under present conditions of management is available for only a short season of the year. Crop residues, mainly the straws of cereal crops, provide the greater part of the bulky fodder consumed by this large cattle population. The direct bearing of this question on crop planning will be obvious from the fact that of the total cropped area of some 260 million acres in British India, 201 million acres are occupied by food grains and pulses—practically all crops the straw of which is used for bulky fodder. On the other hand the total area in India under special fodder crops, so far as the records go, is only about 3 or 4 million acres.

As all those acquainted with the crop production in the villages of India know, the average cultivator is greatly influenced in his cropping schemes by the necessity for providing fodder for his cattle, and it is not the purpose of the present note to suggest any disturbance between the general relationship between straw and other crops. It is, however, desired to suggest for consideration a possible means by which the feeding of Indian cattle could be qualitatively improved.

2. During the last quarter of a century, the Agricultural Department has been systematically producing and bringing into general cultivation heavier-yielding varieties of the main staple crops and the areas under the improved varieties of the principal of these are shown in the following table. Speaking broadly, heavy yielding crops are now produced on not less than 2 million acres and the area is automatically increasing in many tracts. Though the recent rise in world prices has ameliorated the position, it is still broadly correct to say that we do not desire any considerable enhancement in the production of

these staple crops at present—indeed in the case of both jute and sugarcane a reduction is called for. Obviously the bringing into cultivation of high-yielding varieties of crops may either increase the total production on the existing acreage or enable the existing production to be obtained from a smaller area, and it is manifest that the latter process is a source of profit to the grower even in times of depressed prices and limited demand. It is suggested that at this juncture we should pay more attention to crop planning from the point of view of improving the standard of agriculture and particularly to the better feeding of our cattle. Better-fed cattle mean a more prosperous cultivator, a better standard of cultivation and a better fed cultivator so that we are working for an all round increase in efficiency. It is therefore suggested that, in those areas where improved high-yielding varieties of crops, which it must be remembered are on the average giving 15 per cent. more per acre than the varieties which they have replaced, each agricultural department should definitely set itself to secure the diversion to fodder production of part of the area so released. It is not suggested that each cultivator can automatically devote one-fifteenth of his wheat area or one-fifteenth of his cotton area to fodder production. Due regard must be had to the circumstances of each holding and to each cultivator's requirements. But the principle is commended for consideration and there is little doubt that each agricultural department has at its disposal a substantial amount of information regarding fodder crops which might be encouraged in particular districts.

Our object being to raise the general standard of efficiency of village agriculture, it is obvious that the diversion of small areas from the staple crops to fodders will be most effective if leguminous fodders can be utilised. Fortunately we have a wide range of choice. The cold weather fodder crop—berseem (Egyptian Clover)—has been successfully grown without irrigation over large portions of India, and the same is true of that other important fodder crop—lucerne—whilst locally *Senji* (*Melilotus parviflora*) and Shaftal (Persian Clover) have proved successful. Berseem in particular has proved itself a satisfactory crop for 'Soiling' the animals being tethered on the crop, thus saving the expenditure on harvesting and carting. Apart from these there are many indigenous Indian leguminous fodders, which are also grown as pulse crop during the monsoon, which are valued both in India and in other parts of the world as fodders. It is sufficient to mention as examples of these cowpeas, meth, urid, and soya beans. It is suggested that this matter might be given serious consideration. Apart from pulse crops there are many straw crops, as for example, *juar* and maize, which can be satisfactorily converted into silage even though on a comparatively small scale.

There is also a whole range of perennial grasses (Gumeas Grass, Rhodes Grass, Elephant Grass) which can be grown wherever water is available. They can be planted on the sides of nallas, the places where there is leakage or spilling from canals or wells, and beside irrigation channels. They are a perfect means of utilising the flushings of byres. They are specially valuable for dairy and pregnant animals, and are of great use to all stock.

Another opportunity for crop-planning, with the object of making better provision for fodder crops, occurs when the consolidation of holdings is being effected. This is a subject in which very considerable progress has been made in certain provinces, notably the Punjab where the total area consolidated exceeds 63,000 acres. The nett result of the consolidation of holding is almost invariably to increase the total amount of cultivable land available in the village. Even after squaring up there must be some small fields and odd corners and where Land Consolidation or Better Farming Societies are at work there would seem to be an outstanding opportunity for encouraging greater fodder production on the small additional areas made available by these operations.

This note only deals with the possibility of better feeding of village cattle without any general change in the present system of agriculture. In many cases

there are probably greater possibilities of economic development by the substitution for the production of crops for sale off the land of the growing of fodder crops for feeding on the holding for the production of milk (and/or ghee) for the market. As in this is involved the whole question of the development of the dairy industry of India, on which a special report by Dr. Wright is expected shortly, the matter is only briefly mentioned here.

Area under improved crops in British India during 1935-36.

Province.	Rice.	Cotton.	Wheat.	Jute.	Sugarcane.	Other crops.
Madras	1,063,299	617,942	..	..	58,049	205,055
Bombay	13,524	692,617	25,871	..	13,960	224,830
Bengal	720,126	..	..	1,103,926	277,322	18,047
United Provinces .. ..	..	397,000	2,637,000	..	2,167,000	543,700
Punjab .. ..	..	2,076,100	3,476,800	..	226,300	..
Burma	1,058,784	5,684	24,290	..	16,197	322,233
Bihar and Orissa	52,849	..	64,329	1,203	429,832	17,132
Central Provinces	585,688	505,327	590,025	..	..	365,544
Assam	42,609	..	..	15,890	14,498	5,889
North-West Frontier Provinces .. ..	..	900	15,044	..	148	2,657
Sind	27,787	204,290	105,217	..	..	14,522 (1934-35 figures.)
Baluchistan .. ..	..	..	(NOT available).			
British India	3,546,606	4,499,860	6,938,576	1,121,019	3,203,306	1,819,619

